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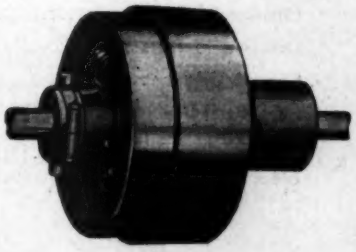

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Vol. 3—No. 4

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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David and the Giant

By JAMES H. BUSWELL

ON THE opposite hillside is a Giant, standing between us and the customers we wish to capture, defying us to come on. "I will give thy flesh to the birds of the air, and to the beasts of the field," bluffs this forbidding Problem.

Let's name this Giant "Sales Resistance"—the factor to be overcome before we can "get at" the business awaiting us among our Philistine prospects.

We are told that David the shepherd lad left his father's flocks and came down to visit his brothers who were soldiers in the forces of King Saul. Here David saw Goliath ponderously strut out to his vantage point on the opposite slope and hurl defiance at the armies of the Living God. Here he observed with growing amazement the cringing attitude of his brothers and the other soldiers.

The armies of Saul, King of Israel, were skilled in the use of the ordinary fighting weapons—all of which seemed inadequate against Goliath, the threatening Giant.

Subtle appeals, a discussion of mechanical differences, the elements of style and workmanship, testimonial statements, all these were useful, and often "heavy" sales armor, helmet, coat of mail and sword. Yes!—valuable in winning a general victory but ineffective when used to overcome the great brooding evil spirit of Sales Resistance. The ordinary armor and weapons of combat were discarded by David because they would impede his progress. A similar course is sometimes necessary today.

David had his own ideas—but remember, if you please, that to the Israelitish armies David's stunt was the prize joke of the year—until Goliath toppled toward terra firma.

If there's someone in your organization with ideas that seem wild and unusual, why not listen to his story and consider his plans? He may have just what you want. If you commission him to go ahead, wouldn't it be a good plan not to tangle up his initiative with the red tape of precedent?

David refused to fight with the heavy tools that were unfamiliar to him.

On his way to the front he "chose him five smooth stones." Stones that had been worn smooth by the waters of years. He put these in his bag of tricks and was ready for the hulking problem on the desolate hillside.

Here are some things you may note as you read this fine old story in the seventeenth chapter of First Samuel.

David went Goliath one better in handing out a line of emphatic conversation. He was so positive of success that he must have planted the seeds of defeat in the overgrown enemy who strode across the pasture toward him. A handicap that makes business problems today seem puny was squarely met by David in the spirit of confidence and optimism that contributes to selling success.

We are told that David "hasted, and ran toward the army to meet the Philistine." Did he wait for business to improve? It was getting worse every minute!

The manufacturer, wholesaler and retailer who eases down his prices a little at a time—saying "Ouch!" with every notch—is passing up a great opportunity, it seems to me, that might be employed if he took his medicine somewhat more heroically. He is overlooking the chance to boldly strike at the Goliath in his sales field. He is avoiding instead of using prices. He is robbing himself of a great deal of credit which his customers are only willing to hand him if he makes reductions decisive and noticeable.

The concerns who are boldly and honestly putting emphasis on PRICE are "coming back" as gloriously as did the children of Israel following the slaying of Goliath.

New prices are smooth stones of today!

If price is a sales handicap and also the thing in which people are most interested, does it not then become the one greatest outstanding appeal for advertising messages today?

I think we might well **begin** our sales talk and advertising messages with price instead of ignoring it. Sales logic of a few years ago is piffle this morning! All the usual arguments—mighty effective when conditions are more buoyant—have retreated before evident, arrogant Sales Resistance.

Strip down to the fighting trim of yore. Get as close to your Philistine Prospects as you can with the effective sling of newspaper and direct advertising. Then—as you hasten toward the problem—choose carefully prices that appeal. Your Goliath selling problem will crumble when these smooth advertising stones are slung.

A right, red-hot price—dramatically announced—will work wonders in clearing the way for the bigger business just up the hill!

A Nation Wide Service *for* Advertisers and Printers

Making your paper purchases a more profitable investment

THE most comprehensive paper service ever established has been inaugurated simultaneously in all of our branches clearing through headquarters in Chicago. It is for the firm who issues or prints advertising literature ranging from the smallest booklet up to catalogues the size of Montgomery Ward or Sears, Roebuck.

It covers the selection and use of the cheapest grades to paper and cover stock De Luxe, and every size and weight known to the paper business.

From folders to broadsides and from phantom weights to bristols as heavy as lumber, your every need is covered, as well as papers for every process of reproduction that will reproduce merchandise, products, or service, in a manner second only to the original.

The publisher will find our manufacturing service covers every grade of magazine book, from the cheapest to the best, any finish, any quality, any tonnage. Books, magazines, publications, each have a mission which is enhanced or retarded by the paper used.

SEAMAN SERVICE PAPERS

"For every printing need"

Seaman Paper Co.

1174, 208 South La Salle Street

Chicago

Business Vitality

By R. L. S.

THE honest business man today is asking himself many questions as to his own responsibility for the conditions he sees about him in the business world. It must be evident to any rational observer, who is more interested in finding a healing than protecting his own opinion, that if activity can be perpetuated under those negative conditions which held sway for the period of the war, constructive need as found in the demand for better conditions in life ought to stimulate larger activities bringing about a happier result.

When every man struggles to make better instead of bigger business; when each is more interested in his moral bookkeeping than in his financial bank account, we shall have a square and level actual, that will hold business on an even keel, adding vivacity to business association and making it something more than a money grabbing game.

The only competition between men interested in the same line of work should relate to quality rather than quantity. If we can grow into a state of thought relative to our business associations that makes us vie with each other to do best rather than most, we shall have gained a point.

Many broad-minded men are coming to the point where they question the whole system of production based on a foundation of mere monetary loss and gain. Friendliness between buyer and seller, or employer and employe is as actual a resource as a live bank account.

The time has come when the man who will persist that it is his mission in business to beat out and eat up the man who seeks a livelihood along the same lines of endeavor, is himself a defunct antiquity, fast being buried beneath the dead history of useless methods. Men with broad vision today are fast becoming so interested in the good they can do with their business activities as levers for human progress, that selfishness is fast being lost sight of as interest increases in the good of the whole.

Wit and good will in business life must be recognized as essential factors which make for business success, more vital in action than capitalized envy, working in exactly the reverse direction, not to absorb but to express, not to extract with the grouch of greed, but to propagate so generous an atmosphere that no employe will be prompted to throw the gravel of an aggravated temperament into the machinery of the day's work.

Demand and supply are equal,
While envy and greed betray.
The end of each is the good of all,
And good will wins the day.

We Are Specialists

Not Only In
Building the Largest
and Fastest Running Paper
Machines In the World
But Also In

Increasing the Production *of* Your Present Machines

We will send
an expert production
man to go over this matter
with you at any time
free of charge

The Bagley and Sewall Company

Watertown, New York

U.S.A.

Safety Work in the Small Plant

By C. W. PRICE

"ORGANIZED safety work is all right for the large plant, but not practicable for the small plant," is a statement sometimes heard among the members of the National Safety Council.

This opinion arises largely because of the lack of first-hand knowledge regarding just what organized safety means—the failure to appreciate the few fundamental principles which determine the success or failure of safety work in any plant, irrespective of its size.

Organized safety work in a large plant resolves itself into departments; the efforts which really reach the workmen and grip their interest are centered in the department and not in the front office.

Hundreds of small plants in the membership of the Council are making just as good records in stimulating interest among their workmen and reducing deaths and serious injuries as the larger plants.

Now there is no difference, so far as the essentials of safety are concerned, between the small factory with fifty to one hundred men and a department with an equal number of men in a large plant.

Let us consider those features of a safety organization which are really vital, and which have to do with the development of a genuine safety spirit, and see whether they do not apply as well to the small plant as to the large.

It goes without saying that the problem of equipping a small plant with mechanical guards is the same as equipping a department in a large plant.

The foreman who occupies the key position in a large plant and through his efforts determines the attitude of his men towards safety occupies the same position in a small plant and can be equally effective.

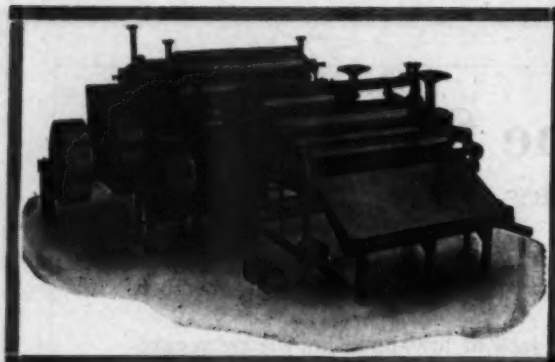
The workmen's inspection committee idea has been most successfully worked out in large plants where three to five workmen, appointed by the foreman, confine their efforts wholly to their own department. A workmen's committee will function quite as successfully in a small plant of one hundred men as in a department of one hundred men.

The bulletin board which plays an important part in all organized educational safety work can be used as effectively in a small plant as in the large plant where each department has its own bulletin board and the bulletins are adapted to the hazards of each department.

In order to stimulate interest among the workmen it is coming to be more and more the custom to conduct plant meetings with moving pictures and safety talks. Many times these are conducted in departments. Such meetings are just as successful in a small plant.

The first-aid departments in large industries are coming to occupy an increasingly important place in accident prevention. In many small plants efficient first-aid work is being done by a man or woman giving part time to the work, under the training and supervision of a physician who visits the plant once or twice a week.

In a small plant the manager and superintendent often know each employe personally and call him by his first name, and thus are able through personal contact to develop a real family spirit, which it is impossible to develop through any plant magazine or other methods used in larger industries. In view of the fact that the spirit of safety in a plant depends so largely upon the leadership of the manager, superintendent, or foreman, it is possible through the personal touch to grip the interest of the entire force of a small plant in a way that is impossible in a large plant.



Rogers and Special Wet Machines

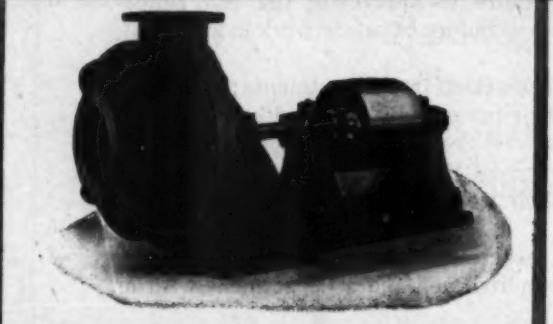
SINGLE AND DOUBLE PRESS

FOR CONVERTING CHEMICAL PULP INTO SHEETS 48% DRY

25-30 TONS air-dry pulp per 24 hours. Built in 72" width only, with patented pulp weakening and separating device or our new automatic knife cut-off attachment.

FREIGHT CHARGES are greatly reduced. Savings on this item alone often pay for the machine in one year.

110 Machines Now in Use. 28 Sold the Past Year



Heavy Duty Paper Mill Pumps

Built Especially for Handling Stock

Impeller—Extra wide, enclosed type and perfectly balanced against vibration and end thrust.

Suction Inlet—Is of large area, giving a free and easy entrance to same.

Our Pumps are economical in use, simple in construction, of very great durability and discharge continuous steady stream.

Standard Wood Pulp Grinder

Built in Three Sizes

Taking wood 24", 30" or 32".

Bridge-trees—Are well proportioned.

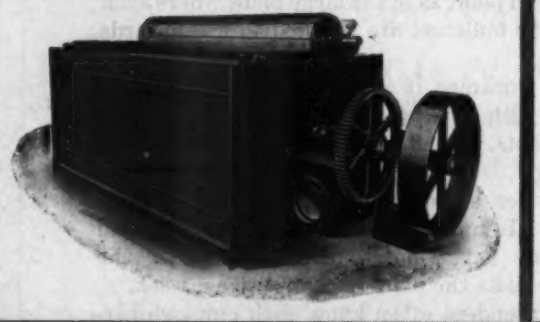
Flanges—Made of steel, 40" diameter.

Hydraulic Cylinders—Copper lined, 12", 14" or 16" diameter.

Pillow Blocks—22" length of bearing.

Pockets—Very heavy and designed particularly for free discharge of pulp.

Service—Continuous distinctive service is always assured.



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Single or Double Cylinder Type

Built in the following sizes:
Cylinder mould diameter, 36" or 40".
Face of cylinder mould, 72", 84" or 96".

Cylinder mould of best reinforced construction and properly supported with our latest design outside bearings.

Vat furnished either all wood or with cast iron ends.

For Stability and Efficiency our Improved Deckers are Unexcelled

See our exhibit at the Seventh National Exposition of Chemical Industries, 8th Coast Artillery Armory, New York, week of Sept. 12th

PULP AND PAPER MILL MACHINERY

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

$300.00 for an Article

Received Between October 1, 1920, and September 30, 1921

THE PAPER INDUSTRY was started with the one idea of being helpful to the whole Pulp and Paper Manufacturing Industry. We believe we have succeeded. At least many people tell us so, but we want to do more in being helpful, so that every man in the industry may know more of his chosen work.

Many men in this industry have valuable ideas that would be worth hundreds, possibly thousands of dollars, for other men to know, and at the same time will not harm the one man that knows it. The old idea of hiding our light under a bushel for fear someone else will learn of something that we may know has passed, and the war was to a large degree responsible for this. It is stated that America advanced more in most of the arts and sciences, as well as manufacturing processes, in the few years of the war period, than it had in fifty years before.

We lose nothing by giving out knowledge. If each of two men have a dollar and each gives his to the other, both will have the same and gain nothing, but if each of two men have an idea, and each gives away that which he has, he does not lose, but each has two, and so if we multiply this by one hundred or a thousand, each man that formerly had only one idea, now has a hundred or thousand, and no one has lost.

So, in order that the greatest number may have the greatest amount of knowledge, and in order to get men to take the time for the proper study and preparation of the right kind of an article, we will give to those who will endeavor to furnish us with real helpful articles, during the next twelve months, the following amounts:

For the best article furnished in this competition, we will give the sum of $300.00.
For the second best article we will pay $100.00.
For the third best article we will pay $50.00.
For the fourth best article we will pay $25.00.
For the fifth best article we will pay $15.00.
For the next thirty-one best articles, we will pay $10.00.
For the next forty best articles we will pay $5.00.

Any one man may write as many articles as he desires, providing they are on different subjects. Each article, however, should fill at least three pages of THE PAPER INDUSTRY.

Several well known men of the industry will be chosen as judges in this competition, their names to be announced at a later date, and the publisher of THE PAPER INDUSTRY will only decide first whether the article is worthy of publishing at all, and if so, then it will take its chance for the $300.00 prize.

In order to make it possible to publish these papers during the next twelve months, papers must begin to come in immediately and the minimum price of $5.00 will be paid for each as they are published, the balance representing the prize money will be awarded after the twelve months period has expired, and the decisions have been made.

Some men feel that they know many good things, but cannot write them down in proper fashion. It will not be necessary that these articles be written to show any great amount of learning, as many men who have had little schooling may be able to furnish the most helpful ideas, and it is something that is helpful that we want; we have an editor for the very purpose of carefully scrutinizing everything before it goes to the printer, so that it may be grammatically and typographically correct.

You can choose your own subject, as there are so many things to be written about in this great industry that we will not even attempt to outline the full list of subjects, but it may be of some plan to get a larger product out of a machine; it may be on the subject of saving in the power plant; saving bleach, dye, or one of many other things; it may be a plan to make the wire or felt last longer; some method of making a better sheet without increasing the cost, or making as good a sheet by reducing the cost; a new idea in the process of pulp making; in fact it can be on any subject that will be helpful to pulp and paper manufacturers, and their employes.

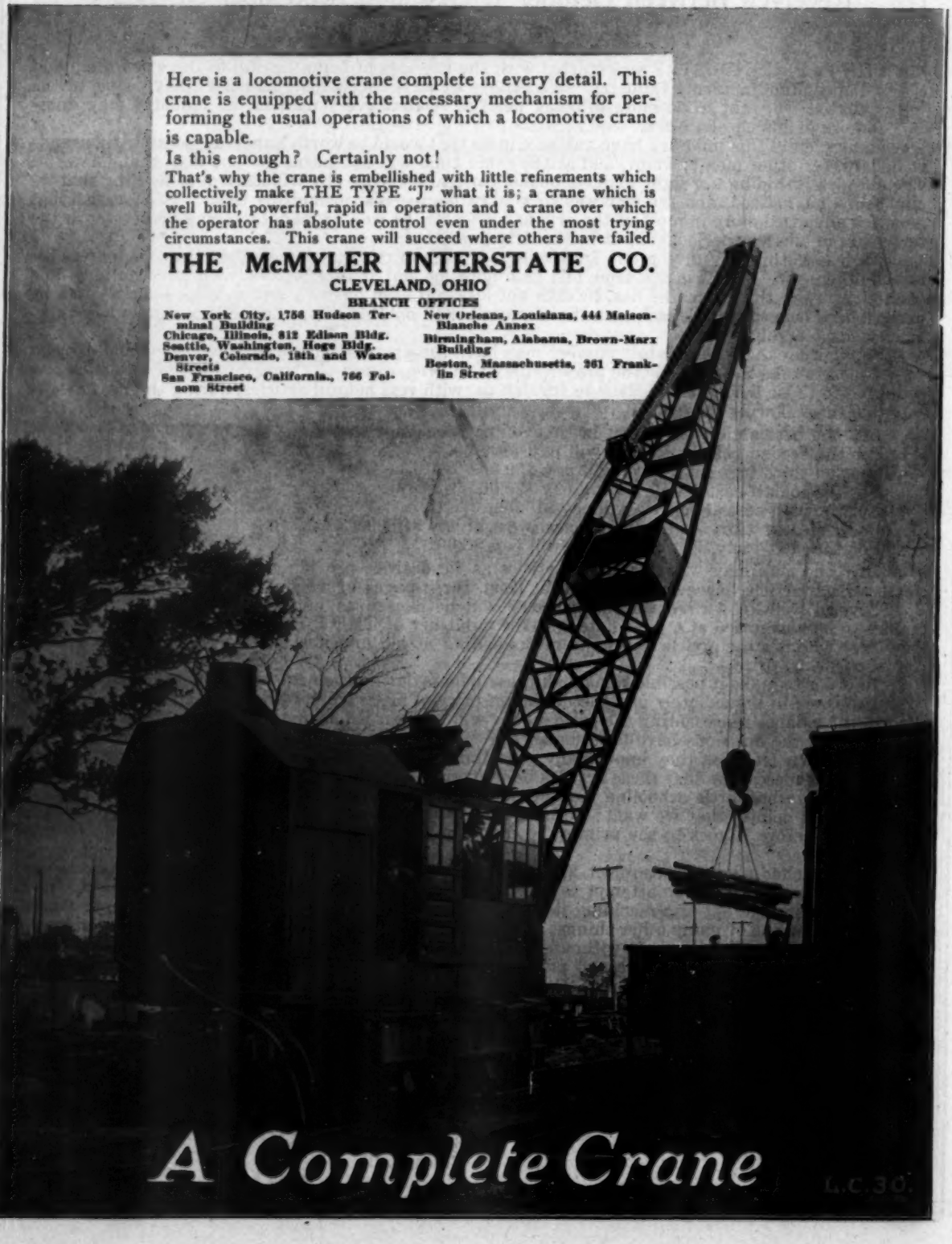
Anyone can try his hand, be he president, manager, superintendent, chemist, engineer, machinery man, foreman, or workman. If some one should feel they cannot write a long article, then write a short one. We will pay for it, if we can use it.

Start NOW and get your article or articles in at the earliest possible time.

Address all articles in this competition to

"Contest,"
THE PAPER INDUSTRY,
356 Monadnock Block,
Chicago, Ill.

Latest Development in Locomotive Cranes for Handling Coal, Pulp Wood, Etc.


Here is a locomotive crane complete in every detail. This crane is equipped with the necessary mechanism for performing the usual operations of which a locomotive crane is capable.
Is this enough? Certainly not!
That's why the crane is embellished with little refinements which collectively make THE TYPE "J" what it is; a crane which is well built, powerful, rapid in operation and a crane over which the operator has absolute control even under the most trying circumstances. This crane will succeed where others have failed.
THE McMYLER INTERSTATE CO.
CLEVELAND, OHIO
BRANCH OFFICES
New York City, 1756 Hudson Terminal Building
Chicago, Illinois, 812 Edison Bldg.
Seattle, Washington, Hoge Bldg.
Denver, Colorado, 18th and Wazee Streets
San Francisco, California., 766 Folsom Street
New Orleans, Louisiana, 444 Maison-Blanche Annex
Birmingham, Alabama, Brown-Marx Building
Boston, Massachusetts, 261 Franklin Street
A Complete Crane
L.C.30

The Testing of Wood Pulp Shipments for Content of Air Dry Pulp

Prepared by the Emerson Laboratory
Springfield, Mass.

Among pulp buyers and manufacturers there seems to be need of detailed directions in the matter of method of testing all kinds of pulp shipments for weight and moisture content which will be sufficiently elastic to fit the needs of every condition of pulp, and yet sufficiently detailed to be a satisfactory guide to the inexperienced buyer or analyst as well as to the official analyst in matters of controversy. We have, therefore, drawn up the following tentative regulations and publish them in the hope that they may receive such careful study and discussion on the part of those interested in the matter as to bring about the formulation of detailed instructions which will meet the general need in the matter.

Determination of Gross Weight of Shipment

THE gross weight of a shipment of pulp should be ascertained by one of the following methods:

(1) The gross weight of the car lot may be taken on accurate railroad scales, less the tare of the empty car actually weighed. The marked tare of the car is not to be accepted unless verified.

(2) The sum of the net weights of truck lots taken while loading or unloading.

(3) In the case of baled pulp, the number of bales may be multiplied by the weight of the average bale obtained by weighing 10 percent of the bales of the shipment, if the bales are reasonably uniform, or 20 percent in case the individual bale weights vary widely, according to the method hereinafter described.

(4) In the case of roll pulp, when the rolls are reasonably uniform in size, the number of rolls may be multiplied by the weight of the average roll obtained by weighing 20 percent of the rolls of the shipment as hereinafter described.

Weighings should be made only on such scales as have been recently checked by a recognized sealer of weights and measures or the accuracy of which has been satisfactorily determined by the analyst in charge of the test.

Determination of Moisture Content of Shipment

Pulp purchasers should ascertain at the time that the contract is made, especially in the matter of long contract, the exact method used at the pulp mill for the estimation of the moisture in the particular pulp in question and, if possible, that an identical method should be used in testing the pulp at the time of receipt.

For pulp purchases made in the open market, or in other cases where no agreement has been made as to the matter of method of sampling, the methods hereinafter described are recommended.

Procedure in Case of a Discrepancy

In the case of a discrepancy between the weight as given on the invoice and as found by the consignee, the following procedure is recommended:

Pulp should always be so stored that each car lot forms a distinct, separate pile and no pulp should be used until it is ascertained that the air-dry content as found by the test checks that of the invoice. In case of any considerable discrepancy, the matter should be reported as soon as possible and a retest made by such official tester as shall be agreed upon between the two parties to the contract. Only such claims for shortage should be considered as are made sufficiently promptly to enable the official analyst agreed upon for retest work to weigh and cut samples within ten days of the time of unloading the pulp and when any delay beyond the ten days specified is not the fault of the purchaser. The method to be followed by such official analyst should be such a one of the methods hereinafter described as shall be acceptable to the two parties to the contract.

Procedure in the Case of Reweighing

In the event of it being necessary to reweigh stored pulp by an official tester or analyst, the following procedure is recommended:

Before proceeding to the weighing of a shipment of pulp in storage, the analyst should ascertain that not less than half of the parcel in question is available for such retest.

The procedure to be followed in this case should be one of the following methods and the choice of method should be regulated by the kind of pulp under consideration.

Baled Pulp—Ten percent of the entire number of bales in the shipment, but not less than ten bales, such bales being sound and intact, should be weighed, and from the average weight of these bales, the weight of the shipment should be calculated.

As an optional method, the entire shipment may be reweighed, and this is recommended in cases where the individual bale weights vary widely.

Roll Pulp—The entire shipment of rolls should be reweighed, if available. If this is not possible, then 20 percent of the rolls should be reweighed, such rolls being all sound and intact and as nearly the average size of roll as is possible. From the total weight of these rolls, the weight of the entire shipment may be calculated.

Hydraulic Pressed Laps—(1) If such laps are received tied in bales, and the individual weights of such bales are fairly uniform, then it is sufficient to reweigh 10 percent of the bales of the shipment and, from the average bale weight thus obtained, calculate the weight of the entire shipment.

As an optional method, the entire shipment may be reweighed, but this is only recommended in cases where the individual bale weights vary widely.

(2) If such laps are received tied in bundles or packages, the number of said bundles or packages being stated in the invoice, and the individual weights of such bundles or packages being fairly uniform, then it is sufficient to reweigh 10 percent of such bundles or packages and from the average bale weight thus obtained calculate the weight of the entire shipment.

As an optional method, the entire shipment may be weighed.

(3) If such laps are received tied in bundles or packages, the number of which is not stated on the invoice, or if the individual weights of such bundles or packages vary widely, or if the shipment consists of an indefinite number of loose laps, then the entire shipment should be reweighed. In making such reweighing the analyst must accept the statement of the consignee that the pulp weighed is the entire shipment in question.

Unpressed Laps—The same considerations should apply as in the case of hydraulic pressed laps, as described above.

Procedure for the Taking of Samples

In taking samples for the estimation of the moisture content of pulp shipments while unloading or from storage the procedure to be followed should be one of the following methods and the choice of method should be regulated by the kind of pulp under consideration.

Baled Sheet Pulp, Domestic or Foreign—The method recommended is essentially that which has been adopted by the American Paper and Pulp Association and the Association of Woodpulp Importers and is now in general use.

Ten percent of the entire shipment, but not less than ten bales should be sampled. If the gross weight is to be arrived at by a calculation from the average weight of the bales which are sampled, then only sound and intact bales should be taken for sampling, and these should be chosen from the different sections of the shipment and the analyst should be careful to observe that no unusual conditions prevail in the selection of the bales. If the entire shipment is to be reweighed at the time of sampling, then such bales should be chosen for sampling as will, in the careful judgment of the analyst, most nearly represent the tenth of all the bales of the shipment, whether damaged or intact. These bales may be conveniently chosen by taking every tenth bale handled during the loading or unloading. If, in the best judgment of the analyst, the tenth bale is not representative and should not be chosen, then the ninth or the eleventh bale or the bale nearest to the tenth which is representative should be chosen. The accurate weight of all bales sampled should be ascertained before sampling and no other bales than those weighed should be sampled and, whenever bales are numbered or marked, the number and mark should be given on the report, together with the weights obtained.

The samples should be taken by boring into the bale to a depth of three inches with a special augur which cuts a disk about four inches in diameter. The holes which are bored should be so located that in five successive bales they represent a portion extending diagonally across the bale. Each bale should be bored but once. The first hole should be bored at the corner, the edge of the cut being at a distance of one inch from the edge of the bale. The second cut should then be made half way between the center and the corner of the bale, the third cut should be at the center of the bale, the fourth cut should be opposite the second cut, half way between the center and the corner of the bale, and the fifth cut in the opposite corner in a position corresponding to the first bore.

Ten of these disks should be chosen from each cut as follows:

1 disk 2nd sheet from the wrapper
2 disks 1 inch deep
3 disks 2 inches deep
4 disks 3 inches deep or from the bottom of the cut.

Roll Pulp—Twenty percent of the entire shipment, but not less than twenty rolls should be sampled. These rolls should be so chosen as to represent as nearly as possible an equal number of rolls from the left-hand deckle edge reel, the right-hand deckle edge reel, and each of the center reels of the entire machine roll. This is essential for correct work since the moisture in the various reels coming from the same machine at the same time has been shown to vary by as much as 8 percent.

If the gross weight is to be arrived at by a calculation from the average weight of the rolls which are sampled, then only sound and intact rolls, whose size is as near the average size as is possible, should be taken for sampling, and these should be chosen from the different sections of the shipment with the same care as is recommended in the case of baled pulp. If the entire shipment is to be reweighed at the time of testing, then such rolls should be chosen for sampling as will, in the careful judgment of the analyst, most nearly represent 20 percent of all the rolls of the shipment, whether damaged or intact. The accurate weight of all rolls sampled should be ascertained before sampling, and the average roll weight obtained from the weights of the rolls which are sampled should approximate closely that arrived at by the reweighing of the entire shipment.

Rolls should be sampled by one of the two following methods:

(1) **The Disk Method for Roll Pulp**—The samples should be taken with the same cutter as is used in the case of baled pulp. The holes which are bored should be so located that an equal number will have been taken from each position with reference to the drying machine. One-third of the reels from the left deckle edge of the machine should be bored at the center of the reel, one-third 3 inches from the deckle edge and one-third 3 inches from the cut edge. The same rule for location of cut should be followed in boring the reels from the right deckle edge of the machine and the center reels without deckle edge.

The hole bored should be 3 inches deep and five disks should be chosen from each cut as follows:

1 disk 2nd from the wrapper

1 disk 1 inch deep

1 disk 2 inches deep

2 disks 3 inches deep or from the bottom of the cut.

If the weight is to be accepted as invoiced and moisture only is to be checked, then the disks should be bored as above, but the five disks should be chosen from the bottom of the cut.

(2) **The Strip Method for Roll Pulp**—The rolls which have been chosen for sampling should be cut from end to end to a depth of three inches and five of the sheets so formed should be chosen as follows:

1 sheet 2nd from the wrapper

1 sheet at a depth of 1 inch

1 sheet at a depth of 2 inches

2 sheets at a depth of 3 inches.

From each of these sheets a strip 1½ inches wide and extending the full length of the roll should be cut and preserved for sampling. The width of strip may vary from 1 to 3 inches, but all strips of the same sample should be approximately the same width.

Lap Pulp, Hydraulic-Pressed—(1) If such laps are baled, then 10 percent of the number of bales should be chosen for sampling. If the entire shipment is to be weighed at the time of sampling, then the bales for sampling should be so chosen as to most nearly represent the condition of the entire shipment, that is, if any unusual condition prevails in a portion of the shipment, such as a wetting of one end of the car, or an unusual amount of drying out of the top layer or near the door of the car, then the same proportion of the bales intended for sampling should be chosen from these abnormal bales as exist in the car. If the gross weight is to be calculated from the average weight of the 10 percent of the bales, which are chosen for weighing and sampling, then only such bales should be chosen as are sound and intact and which, in the judgment of the analyst, have not been subjected to any abnormal condition during transportation.

The accurate weight of all bales to be sampled should be ascertained, after which the bales should be broken open and such a number of laps chosen as will give a total of not less than thirty laps and not more than forty laps. If only one lap is to be chosen from each bale, then from the first bale the outside lap is to be chosen, from the second bale the second lap, from the third bale the third lap, etc. If two laps are to be chosen from each bale, then from the first bale the first and second laps should be chosen, from the second bale the third and fourth laps, from the third bale the fifth and sixth laps, etc.

(2) If such laps are tied in packages or small bundles, then not less than thirty nor more than forty such packages or bundles should be chosen from all parts of the car and one lap should be chosen from each such package or bundle.

(3) If such laps are piled loosely in the car, then not less than thirty laps nor more than forty laps should be chosen from different portions of the car. This may be conveniently done by choosing one or two laps from each truckload of laps as the pulp is being unloaded.

The laps which are chosen for test should be sampled by one of the two following methods. In either case the depth of the cut should be half way through the lap.

The Strip Method for Hydraulic-Pressed Lap Pulp—The strip method is in use in a large number of mills making hydraulic-pressed pulp and, therefore, should be used in the testing of all pulps from such mills. The strip method is approximately correct if applied as follows:

One strip should be cut from each lap, one-third of the number from the center of the wet edge and perpendicular to that edge and two-thirds of the number from the center of the end of the lap and perpendicular to that edge. The strips should be two inches wide and of such a length that the sample shall represent the same proportion of relatively wet edge and of relatively dry center of the lap as is found in the average lap of the shipment. The length of each strip should be accurately measured and the width of all strips in the same sample should be approximately the same.

Example. If the laps average 20x30 inches in size and the average width of the unpressed lap edge is 3 inches, then each strip cut should be 9.4 inches long. If such strips are cut one inch too long or one inch too short, the sample may contain as much as 2 percent more or less dry pulp than is found in the entire lap.

The Wedge Method of Hydraulic-Pressed Laps—The modification of the original Woodruff method, as proposed by F. M. Williams, seems to be reasonably correct in theory and more convenient than the original method and, therefore, this modified method may be used where the wedge method is desired.

This wedge should be 2½ inches wide at the edge of the lap and should extend to a point in the exact center of the lap. One wedge should be cut from each lap. One-fourth of the number of wedges should be cut from the middle of the dry edge of the lap to the

center, one-fourth of the wedges from the middle of the wet edge of the lap to the center, and one-half of the wedges from the middle to the end of the lap to the center. It is important that these wedges be cut accurately, using a measure in each case, and that the point of the wedge be not lost in removing the sample from the cut. A variation of one inch in the total length of the wedge will cause an alteration of the total moisture found in the sample of from 1 to 2 percent.

Lap Pulp, Unpressed—Forty laps should be chosen for sampling. If the sampling is done at the time of loading or unloading, then it is convenient to choose one or more laps from each truck load, but if any abnormal condition exists, such as an excessive drying out of the top layer or near the door, or a wet end of the car, then the same proportion of laps should be chosen from these abnormal laps as exist in the car. If the sampling is done on pulp which is already in storage then no lap should be chosen which is not covered by at least four other laps and so surrounded that the edges have not had opportunity to dry out, and the laps chosen should be as thoroughly distributed throughout the pile as is possible.

For this kind of pulp the strip method is recommended exclusively. These laps are made on a wet machine and moisture variations are largely due to differences in the pressure of the roll across the sheet; therefore, the scientific and practical method of sampling this pulp, both at the pulp mill and at the paper mill, is by taking a strip across the lap in the machine direction.

Strips should always be cut across the lap from deckle to deckle and, in sampling at the receiving station, may be sampled by cutting of inch-wide strips from the folded lap, or the lap may be spread open before cutting, at the convenience of the analyst.

Procedure for the Handling of Pulp Samples After Cutting Them

Samples should be deposited, immediately after cutting, in a metal can with a tight-fitting cover and the net weight should be obtained as soon as practicable after the taking of the samples. In the case of an unavoidable delay between the time of taking the samples and of weighing, a special precaution should be taken to seal the edges of the cover with friction tape or otherwise.

The scales used for weighing pulp samples should show a decided deflection by the addition of 1 gram or .03 ounce and two weighings of the same article taken at different times should not vary by more than that amount and the sensitivity of the scale should not be decreased below that amount when carrying the maximum load of pulp.

After the wet weight of samples has been ascertained, samples should be placed in a suitable oven and dried at a temperature as near 212° Fahr. as possible until two consecutive weighings, taken not less than four hours apart, do not differ by more than 3 grams or 0.1 ounce, and the minimum of these weights should be taken as the bone-dry weight of the sample. The entire bulk of the sample selected from the pulp should be dried out for the test. The temperature in the drying oven should not exceed 220° Fahr., nor, except when containing wet pulp, be less than 204° Fahr. No wet pulp should be put in the oven in the four-hour interval between the two final weighings of a lot of pulp already in that oven, nor should there be any other source of excessive moisture in the air passing through the oven just prior to the final weighing of a sample of pulp. All bone-dry weighings should be made as rapidly as possible after the removal of the pulp from the oven and before the pulp has had an opportunity to absorb moisture from the surrounding air.

Calculation of the Air-Dry Content of a Pulp Shipment

The bone-dry weight of a pulp shipment is considered as 90 percent of that of the air-dry weight. Therefore, in order to arrive at the air-dry content of a pulp shipment, the percent of bone-dry pulp found in a sample should be multiplied by 10/9th, then by the gross weight of the shipment.

Considerations Involved

The following points have been considered in formulating the foregoing rules for the estimation of the air-dry content of wood pulp shipments:

1. The careful and continuous checking of the weight and moisture as given on every invoice of pulp shipment is especially urged upon all pulp buyers as a means of stimulating greater care in the obtaining of the invoice figures.

2. The proper time for a pulp buyer to take up the matter of a moisture test method to be used on a particular grade of pulp is at the time that the contract is made. Even though the buyer understands that the method used at the pulp mill is not theoretically correct, if the pulp was purchased with the understanding that such a method is in use at the pulp mill, then the pulp should be tested at a receiving mill by the same method as that used at the pulp mill. If the same method is used at the pulp mill and at the receiving mill and the manipulative details are accurately followed in both tests, the buyer can feel justified in making claim for a variation of more than 2 percent in the air-dry content of the shipment.

3. In the recognized method for the sampling of baled pulp, the instructions are that not less than 5 percent nor more than 10 percent of the bales should be sampled. In matters of controversy, the request for the reweighing of 10 percent of the bales has been so general that in these recommendations the minimum of 5 per cent has been omitted. Baled shipments usually contain 180 to 350 bales to a car, so the sam-

pling of 10 percent of the bales is not an excessive hardship in any case.

4. In the retesting of stored, baled pulp, analysts are frequently requested to reweigh the entire shipment and retest 10 percent of the bales. However, the gross weight as calculated from the weight of 10 percent of the bales chosen for sampling usually checks reasonably close to the gross weight obtained by reweighing the whole shipment. In the rehandling, bales are frequently damaged and if the whole shipment is reweighed, a portion of these damaged bales must be sampled. For this reason, the recommendations strongly favor the reweighing of only the 10 per cent of sound and intact bales which are to be sampled.

In the retesting of stored roll pulp, the recommendations favor the reweighing of the entire shipment where possible, since these rolls usually vary widely in weight and it is not possible to obtain an average roll weight by the weighing of a small number of rolls. If the whole number of rolls in the shipment is not available, then 20 percent should be weighed in order that the average roll weight can be obtained.

5. Roll pulp is run on a drying machine which is from two to five reels wide and is usually tested at the pulp mill by taking at regular intervals a strip the full width of the machine from deckle edge to deckle edge. For this reason the scientific method of sampling such pulp at the receiving mill is by choosing for sampling such proportion of right deckle rolls, left deckle rolls (as determined by the direction in which the pulp is rolled) and non-deckle edge rolls as will represent an even number of rolls from each portion of the machine and sampling each roll by cutting strips the full length of the roll. However, the carrying out of this method at a receiving mill, especially with a pulp which is already in storage or one made on a drying machine which is four or five reels wide, is looked upon as complicated and introducing more error in manipulation than would result from a simpler method. For this reason, the usual method for sampling roll pulp is by boring disks from the rolls selected at random from the shipment. While the results of this method have been so frequently criticized that we have suggested the more laborious method of choosing the rolls for sampling according to position on the drying machine, we are of the opinion that if 20 percent of the rolls, representing equally all portions of the shipment, are chosen without consideration of position on drying machine, results are usually satisfactory.

6. In the matter of the disk method of sampling roll pulp, so far as is known to the writers of these recommendations, no research has been done which would assist in determining the exact position on the roll at which the two end borings should be made. Instructions in use locally vary from one inch from the end to six inches from the end. Therefore, in the recommendations, the arbitrary distance of three inches has been fixed.

7. In the matter of the hydraulic-pressed laps, there seems to be no question but that Mr. Woodruff thoroughly analyzed the condition of the laps and proposed the only really scientific method which has been submitted for sampling. The moisture content of the strip sample as usually taken bears no relation to the moisture content of the entire lap and usually favors the pulp seller. Some pulp mills are taking wedge samples, bnt so incorrectly that it is no improvement except in name. One pulp mill, at least, is following carefully the Woodruff method of sampling. The seeming difficulty in the marking out of the wedges appears to discourage the average man doing routine pulp testing and for that reason, although the Woodruff wedge method is the most correct method which has been suggested and has been discussed for several years, it has not met with very great favor as a regular practice. For this reason only, it is omitted from the recommendations, and in its place are two, approximately correct, but simpler methods. The error in the strip method as proposed is that it assumes that the whole portion of the lap which has been under the press is equally wet, which is not true, especially with laps which have been stored for some days between the time of pressing and of testing. The error in the Williams modified wedge method is that it assumes that the moisture content of the center of the wet edge is the same as that of the corners of the lap, which is probably not true. However, the error in either of these cases is probably not appreciable.

8. Some pulps are shipped on skids and for this kind of shipments a method should be adopted, but the writers are not prepared to make recommendations for skid pulp.

My Auto, 'Tis of Thee

My auto, 'tis of thee, short road to poverty, of thee I chant. I blew a pile of dough on you three years ago; now you refuse to go, or won't or can't. Through town and countryside you were my joy and pride, a happy day. I loved the gaudy hue, the nice white tires new, but you're down and out for true, in every way. To thee, old rattlebox, came many bumps and knocks, for thee I grieve. Badly thy top is torn, frayed are thy seats and worn; the whooping cough affects thy horn, I do believe. Thy perfume swells the breeze, while good folks choke and wheeze as we pass by. I paid for thee a price, 'twould buy a mansion twice; now, everybody's yelling "ice"—I wonder why? Thy motor has the grip, thy spark plug has the pip and woe is thine. I, too, have suffered chills, fatigue and kindred ills, endeavoring to pay my bills, since thou wert mine. Gone is my bank roll now, no more 'twould choke the cow! as once before. Yet, if I had the mon, so help me John—amen, I'd buy a car again, and speed some more.—L. S. Smith & Bros. Co.

Handling the Employment Problem

By F. H. ROSEBUSH

Manager, Department of Industrial Relations, Nekoosa-Edwards Paper Co.

TIME was not so many years ago when the foremen or superintendent did his own hiring. And when labor was plentiful he had an opportunity to choose, the results being fairly satisfactory. Along with the hiring was the equally important function of firing. This system of hiring and firing was so much abused throughout the great manufacturing plants, that the need of a change brought on the Employment Department. And because there was a centralized department where all applicants pass for inspection and all requests for workers centered, there were a number of activities and interests that naturally gravitated to that department. Some of these activities were the First Aid work with its hospital and plant nurse, and the Safety First work was a part of those activities. Athletics or sports of any kind were some of the things this Employment Department fell heir to. So diversified were the interests of this department, that the need of a more comprehensive name was met by calling these departments the Department of Industrial Relations. While most large plants have established such departments, for the benefit of those that are groping for a solution of this vexatious problem, an illustration of how the employment work is handled at the Nekoosa-Edwards Paper Company may be of interest to the reader.

In the first place, it would be well to state that the employer contemplating a change would do well to bring the change about gradually. We know of plants that we think handle the labor problem better than we do, but we feel that we still are aiming at an ideal, and we always want to feel that we are striving toward an ideal. The things we have evolved have come by slow steps, but what may work or be satisfactory for us may need changing or adjusting to meet the needs of other plants. So we are not handing out our methods as a panacea for this problem. There may, however, be some phase of the employment problem that appeals to you, and any manufacturer that would like to ask questions or visit us to see how it actually works is welcome to ask or come. They are welcome at all times.

Name Allen S. Dowd | Address Nekoosa Wis. | Date May 15-17

Age 38 | Height 5-10 | Weight 170 | Sight Hearing Good Good | Rupture no | Telephone Red 90

Married Yes | Dependents 2 | Work Wanted Carpentering | Temp. Perm.

Work here Before No | From | To | Dept. | Rate

Reason for leaving —

Schooling 3rd yr. Hi. | Read English Yes | Citizen Yes

Have you a Trade Yes! | Nature Carpentering | Experience 8 yrs —

Where last Employed Wood Co. Const Co | Reason for Change No work

Remarks: Bro. in law of J. H. Krause

General Appearance:- Fine

General Characteristics:- Good

In case of accident notify:- Mrs. Dowd Nekoosa Phone Red 90

Date	Time	Rate per Hr.	Card Number	Date	Kind of Work	Dept.	Mill

Fig. 1—Employment registration slip

So, let us suppose you were applying to our mills for employment. As all of our employing is done at Port Edwards, where the main office is located, should you apply at Nekoosa, three miles away, where a large part of our mills are located, you would be directed to go to the Mill Office at Port Edwards. You arrive at Port Edwards and find a large two-story brick building, in one corner of which are situated the punch clocks and time cards for the Port Edwards Mills. There are two doors for the men punching cards, but a third with glass panel has the fol-

lowing interesting legend: "Department of Industrial Relations; Timekeeper; First Aid; Reading Room; Chemical Laboratory; Engineering Department."

The last two departments occupy the entire second floor, and are up-to-date to the last detail.

You open the door and the first thing you see is an Information window with an attractive young lady opening it, ready to answer your query. When you make it known to her what you wish, you are told to step inside the office and talk to Mr. Rosebush, who is the manager of this department. If Mr. Rosebush is out or is busy, you are directed to his assistant, who has a desk in the room adjoining. As Mr. Rosebush spends most of his time in the mills at Port Edwards or Nekoosa, the assistant will likely attend to you. This assistant will find out from you where you are from, where you have been working, and will be sizing you up casually, and if he thinks you are a likely prospective employe, he will take your application. A sample of this card, filled in, is shown in Fig. 1. The applicant is asked these questions primarily that the company have a record of the employe. More consideration is given the married man than the single man, and the married man with dependent

PROOF OF AGE

Child Labor Permit on file.....

Birth Certificate.....

Baptismal Certificate.....

Date of Birth.....19.....

Place of Birth.....

Name of Father.....

Name of Mother.....

----0----

In case I voluntarily leave the employ of the Nekoosa-Edwards Paper Company, I agree to give five days notice.

Allen S Dowd

EMPLOYEE

Fig. 2—Back of No. 1—Used for proof of age and 5 day notice agreement

children is, of course, given the utmost consideration. By consideration we mean, if men are to be laid off, through shutting down of a department or for other good reasons, the single men go first.

If it happens that there is no work for the applicant on the day on which he applies, he is told what

NEKOOSA-EDWARDS PAPER CO.

EFFICIENCY DEPARTMENT

----0----

Superintendent's Notification of Labor Employed

It is proposed to employ .....

Name Allen S. Dowd

In Dep't P.E. Repair Crew

As (nature of work) Carpenter

Signed F.H. Rosebush

----0----

If satisfactory please fill in date, and return to this office.

Date when employee began work 5/15/21

Signed by Sup't. R.H. Alexander

----0----

NOTICE:- IN ORDER FOR THIS EMPLOYEE TO BE ENTERED ON THE BOOKS THIS SLIP MUST BE RETURNED TO THIS OFFICE.

Fig. 3—Notification to superintendent

to expect. If he lives nearby, we get his phone number, and if at some distance we even make arrangements to reach him by long distance or telegraph.

This interview is very important. Here is developed whether or not a man is a citizen. While citizenship is not compulsory, we prefer American citizens, and wherever possible we urge our employes to become citizens. The purpose of the interview is to find out something of the character of the applicant. Close attention is paid to the married applicant. How many children, how old, would they be of school age, or if old enough to work would they want to work, what can they do, would the applicant want to rent, build or buy here if suited in employment? Men are not judged by their apparel so much as by their manner of speech and their general appearance and actions. If the applicant makes a favorable impression, the name is placed on the desirable list, but if the impression is not favorable it is marked accordingly, and the man never hears from the company.

However, suppose we have a place, and the interviewer thinks you will do for the place. He asks you

if you are ready to go to work, and if you say you are, he makes out the form known as the employment slip. This is made out in pencil and is later transcribed by the typist in the permanent form for the vertical rack. The carbon copy of the employment card or slip is a green slip, which green color distinguishes this department stationery. The carbon shows on this green slip all the information the prospective employe has given you, but on the back is printed the Superintendent's notification of your employment. This is shown in the accompanying form (Fig. 3). This tells you where you are going to work, and is signed by the man who employed you.

NEKOOSA-EDWARDS PAPER CO.

SUPERINTENDENT'S NOTIFICATION
of
RELEASE of EMPLOYEE
To Efficiency Department

EMPLOYEE Allen S. Dowd

Working in P.E. Repair DEPT.

IS HEREBY RELEASED AND REFERRED

To you for (Transfer

(~~Withdrawal~~ GAVE 8 DAYS NOTICE

SIGNED BY SUPT. R H Alexander

EMPLOYEE SHOULD BRING THIS SLIP TO EMPLOYMENT OFFICE OF EFFICIENCY DEPARTMENT.

Fig. 4—Release or Transfer

Physical Examination Required

All new employes are sent to the First Aid Room for an examination by the nurse. While this is not a thorough physical examination, the eyes, hearing, teeth, and general condition of the applicant are noted. If the applicant has some serious condition that is developed by this examination, the report is sent back to the Employment Department with the adverse report, and if the work was such that the health condition would be unfavorable, the applicant would be turned down. If there is need for more information on the applicant, he may be sent to one of the company doctors. With the nurse's examination approval, you are now ready to find the department in which you are to work.

If you have never been in the mills before, it is likely someone will conduct you to the foreman or superintendent under whom you will work.

You will note that the notification of employment states the nature of the work for which you were employed. If the word "Third Hand," or "Roll Plugger," or "2nd Fireman," the rate is determined by the designation. The superintendent is expected to sign the slip and note the time you started to work, from which time your tenure on the payroll starts.

You will punch a card, that is made out as soon as your employment slip is returned to the timekeeper. This time card gives you a number and you are known more or less as a number from there on.

The state of Wisconsin requires that every employe be insured under the Workman's Compensation Act against time lost due to accidents occurring while on duty. In addition to this the employes of the company have recently organized what is known as the Nepco Employes' Mutual Benefit Association.

It is entirely optional as to his joining this association. It will cost him $1.00 per month while on the company's payroll, a similar amount being paid by the company into a fund which is used to insure the employe against lost time due to sickness, or off duty accidents, or any on duty accident not fully covered by compensation.

NEKOOSA-EDWARDS PAPER CO.

EFFICIENCY DEPARTMENT

-----O-----

Order to Timekeeper
Dep't Rate Transfer

5/25 19 21

Change rate of)
Enter new)
Transfer) Man No. 7V1

Name Allen S. Dowd

From P.E. Repair Dep't to P.E. Wood Dep't

To take effect 7 am. Date 5/25/21

Rate for (New Employee 65
(Old Employee 60

Signed Frank H Roseluck

Fig. 5—Used to change rate

In regard to the matter of promoting production, this very important phase is receiving our close attention now, and we are conducting propaganda along this line in our plant publication known as the Nepco Bulletin. This phase of the work requires judicious handling. The spirit of rivalry must be provided in

order that interest can be maintained. Just as accident prevention is best promoted by rivalry between two departments, so can an increase in production be brought about by almost identical methods, though different arguments must be used. Right now no employer wants to cut wages, but a marked increase in production with the same number of men or the same amount of production with less men amounts to a cut in wages.

Essentially the best way to cut wages is for the employer and employe to cut production cost by increasing production.

In other words, getting back to delivering a fair day's work for a fair day's pay.

Employe's Hand Book

Once on the company's payroll, you will be handed an Employe's Hank Book, which you are expected to read so that you may understand under what conditions you are working and that you may know something of the policies of the company.

In order that the readers of this article may know how the various phases of the employment problems are handled, we reprint from the hand book the following:

"**Release**—Men dismissed or leaving our employ must have a release slip from their superintendent before the Employment Department will issue notice to the timekeeper to pay them.

"**Transfers**—Employes wishing to be transferred from one department to another under the same superintendent, will make application to their superintendent, advising him of their desire to be placed at other work.

"Employes wishing to be transferred from a department in one mill to a department in a mill under different superintendent should apply to the Employment Office, and the matter will then be taken up with the proper parties and arrangements made, if possible, for the change.

"**Vacancies**—Vacancies should be reported promptly to the Employment Office, which will endeavor to secure satisfactory employes to fill the opening.

"**Washing Up**—Washing up and changing clothes must be done before and after hours and not while on duty. Work must not be discontinued before the whistle blows.

"**Smoking**—Smoking is positively prohibited in any part of our mills or yards. Employes found disobeying this rule will be subject to immediate discharge."

The first article in this Hand Book is entitled "Department of Industrial Relations Functions as Seen by the Nekoosa-Edwards Paper Company." We are reprinting excerpts from this article.

"The reputation established by the Nekoosa-Edwards Paper Company for fair dealing with individual employes, has been built up by long years of consistent effort. This 'Good Will' is one of the company's most valuable assets. It is comparable with the 'Good Will' of the company's customers.

"It is important that every employe and every prospective employe shall understand the relation of the company to its employe and also that employes shall realize what the company considers necessary

NEKOOSA-EDWARDS PAPER COMPANY

EFFICIENCY DEPARTMENT

—o—

Order to Timekeeper

Close of Employment

5/25 19 21

Make up amount due employe No. 721

Name Allen J. Dowd

To (time) Card Date 5/20/21

He having surrendered all property and satisfied all claims of company.

F. H. Rosebush

Fig. 6—Pay off slip

on the part of those who wish to gain and to hold employment with the Nekoosa Paper Company.

"The Company, endeavors, by all possible means, to give continuous employment. Experience has shown that during an industrial depression, the company has been one of the last to curtail production and one of the first to pick up as business again becomes normal. Pay has been governed by the cost of living considerations, and has been the going rate in this locality.

"Working conditions maintained are first class. All tour work is based on the eight hour day, 48 hours per week is the base on which time is figured. Day work is on a nine hour basis and is figured on a 54 hour basis.

"The company endeavors to keep all employes in touch with its business and policies through the medium of the Nepco Bulletin and monthly Foremen's meetings.

"Health, Safety, and Comfort of employes are given constant attention. At Port Edwards and Nekoosa are established Health Departments with First Aid Rooms, having competent nurses in charge. The company's object in maintaining the Health Department is not only to provide medical aid in case of injury, but to afford to the employes the aid our nurses can be to them in keeping well. Not only is

this service extended to employes, but anyone in the community can call at these First Aid Rooms for medical advice along health lines. This service is without cost.

"All community enterprises, even though not directly affecting the company's business, are sure of co-operation from the company. The company has always insisted that the community's requirements in the matter of schools, good roads and churches be met. Consideration of need for suitable employment for employes grown old in the service of the company is recognized.

"In case of business depression the policy of the company has been to, first, discontinue employment of new men, thus letting natural labor turnover deplete the force; second, lay off inefficient employes in reverse order of their employment; third, lay off unmarried men, except where special training makes it necessary to keep them; fourth, reduction of hours instead of laying off loyal, efficient workers.

"The Nekoosa-Edwards Paper Company requires of its employes, in order that they may be given continuous employment, first, such general intelligence that they recognize the necessity for co-operation with the management in all possible ways; second, appreciation of the fact that it is necessary to work harmoniously with other employes if the 'Our Big Family' idea, which the management of the company is trying to establish, is to be successful; third, regular attendance is expected. Arrangements with foremen or Employment Department for necessary absence are necessary to proper conduct of manufacturing operations.

"The community of interest of Nekoosa-Edwards Paper Company employes makes it necessary, in the interest of all, that each shall so conduct his own private affairs that reproach to Nekoosa-Edwards employes as such, shall not be possible. This includes adequate provision for health and comfort of employe's family and payment of honest debts.

"The success of the company and the prosperity of its employes are so closely interwoven that employes should endeavor to get the point of view in regard to these matters. The spirit of the company for each employe and each employe for the company is the spirit that will win success for the business and prosperity for the community.

"May we state what we consider the Nepco Creed. The Nekoosa-Edwards Paper Company expects its employes to observe well the following suggestions:

"First—Safety. We believe the safety guard equipment in our mills is second to none in the State, but we are always pleased to get suggestions from anyone for its betterment. Most accidents come from disregarding safety rules, carelessness, scuffling and other bad practices. The sly smoker is also a dangerous man.

"Second—Co-operation. Co-operation means loyalty. Learn to assist in every way the men on your shift and your foreman. Remember, there is but one management and that it is well to work with other departments of the mill in that spirit.

"Third—Cleanliness. Get the habit of keeping your department clean, for cleanliness means health and safety.

"Fourth—Efficiency. Efficiency means safety and co-operation and cleanliness. It also means, do not waste time, effort or materials on your job.

"Fifth—Production. Each man is a cog in the wheel of success of this company. The success is measured by quality and production, and today these measures are the measures of the success of the nation.

"THINK IT OVER!"

The Work of the Paper-Mark

By WALDON FAWCETT

RICH in its achievements as one of the oldest and most extensively employed forms of trade-mark, it is surprising that new work should be found, at this late day, for the watermark, or, as it is more correctly designated, the paper-mark. No innovation in this quarter should, however, come as a complete surprise to the paper maker who remembers the force quickly attained by the movement of years ago which sought to perpetuate, by water-mark, the date of manufacture of every sheet of paper designed for legal documents, for the printing of limited editions of books, etc.

The newest utilization of the paper-mark is that which drafts this ingenious medium of identification not merely to point to the producer or distributor of paper but to the paper user. Paper manufacturers have long been familiar with the demand for the watermarking of private brands, but the latest departure goes even beyond that in demand of concession from the producer of paper. The one no less than the other may appear at first glance to be menacing to the traditions of the paper trade and to the conservative ideals of paper manufacturers who hold that no mark but that of the manufacturer should appear in paper.

In one respect, however, the new recourse to the paper-mark may not be as disquieting to the owner of valuable, established brand names as has been the call for private branding. The private brander usually demands that his name or trade-mark and his alone shall be water-marked in the paper. This insistence may not disturb the paper manufacturer who is putting out a number of grades or classes of paper, some of them so commonplace in character or quality that

no harm is done by anonymity. But it is decidedly disquieting to the manufacturer who produces a specialty that it is so distinctive that it is recognized as unique by the consuming public. Good-will in such a product is deliberately whittled away by private branding, and it is scant wonder that many paper makers refuse to thus share their prestige.

Unlike the private brander, the paper user who has lately shown a disposition to make the paper-mark serve his own ends, offers no objection to the presence of a mill brand along with his business badge. The outsiders who are borrowing the paper trade's medium of identification are of two classes. In one class are the faddists and the fashionable folk who, ever in quest of something new, consider it smart to have the user's private water-mark in his personal stationery, even as they deem it up-to-date to have cigarettes marked with the owner's monogram. This demand for individually-marked paper will always, however, be limited in extent, if for no other reason than the element of expense involved.

Paper-Mark as an Advertising Medium

Susceptible of considerable development, however, is the very latest adaptation of the paper-mark, that which, in effect, employs it as an advertising medium. Strictly speaking, of course, it is only a general advertising or publicity function that is performed by the appearance of a house-mark or trade symbol in the letterheads used in carrying on the correspondence of the identified concern, but when it is remembered that reiteration is the very heart of advertising and that it is the public's familiarity with a trade-mark that nurtures the buying habit, it will be appreciated that there are potentialities in this borrowing from the paper trade. Moreover, not a few business houses and many institutions such as banks and trust companies feel that it gives an atmosphere of distinction if the stationery if water-marked with the name and insignia of the user.

A number of paper manufacturers, while not unmindful of the volume of new business created by the penchant of the general public for water-marks, have become a bit uneasy lest this promiscuous marking of paper jeopardize the good-will of producers. Concretely, the fear has been expressed in some quarters that a contractor for paper, furnished under his special water-mark, might acquire, via trade-mark registration, monopolistic rights in paper of the particular tint or texture with which his mark has been associated. For the principle has been repeatedly established at the U. S. Patent Office, and as often sustained in the Federal courts, that one who selects or sells merchandise may acquire trade-mark rights no less than he who manufacturers the goods.

There is, however, scant danger that the new flock of water-markers, by proxy, can make complications for paper manufacturers. Indeed, there is no likelihood that this form of paper-marking to order will precipitate such disputes over ownership in brand designs as have occasionally grown out of transactions in private branding. The best guaranty of immunity from trouble is found in the fact that new-fangled use of the water-mark by the large consumer of paper is purely an advertising use. And it is well settled that an advertising use does not warrant a trade-mark franchise from the United States Government. To qualify for Federal enrollment, a trade-mark must be used "on the goods." And "the goods," in the case of the average user of specially water-marked stationery are something else,—something entirely different from the letterheads, envelopes, etc., that carry the user's surcharge.

To such lengths has the policy of trade-mark segregation been carried in the administration of Uncle Sam's clearing house for trade-marks at Washington that there has been refusal to give credentials for the use of marks on wrappers, containers, etc., when the real subject of identification has been not the receptacle but the contents of the container. In line with this policy, the paper manufacturers or paper converter may rest assured that if, for example, a user of paper bags or bands or wrappers, who had provided himself with stock carrying his trade-mark perpetuated as a water-mark, were to seek a certificate at the patent office based solely on the supposed extension of his rights, his paper-mark, he would be refused. He would be told, in effect, that he had or could have a registration of his mark for the commodity in which he dealt, but that paper may be trade-marked only by the firm that manufactures or deals in paper. And, by the by, it may be added that shipment of paper from a main office to branches does not constitute commerce in paper.

Double Marking No Ground for Uneasiness

Judging from letters that have been sent to Washington, some paper manufacturers are also apprehensive that if they bow to the wishes of customers who desire to have their individual trade-marks water-marked alongside the manufacturer's name or insignia, trouble may ensue because of the double marking. There is no ground for uneasiness on this score. It is well settled that an article of manufacture may bear two or more trade-marks when the object of each and all is to identify the one article. That is to say, for the sake of illustration, that there would be no disqualification if each sheet of paper in a given consignment bore the paper-mark of the manufacturer, and, likewise, the private brand of a jobber or distributor, if the manufacturer be willing to thus share his prestige. Since there is no objection to an article carrying the marks of two or more "traders," there is just so much less objection to two paper-marks when only one identifies the origin of the paper and the other has, from a technical trade-mark standpoint, no more significance than would a brand or trade name imprinted on the surface of the paper

in ink, in the course of its employment by a consumer.

Because the paper-mark or water-mark is one of the oldest forms of trade-mark and one of the most extensively employed,—as witness the upward of 10,000 marks now current in the American paper trade—it is natural to invest it with especial significance. In the eyes of the government's trade-mark censors, however, water-marking, so called, is nothing more nor less than one of a number of accepted and approved methods of affixing or applying a trade-mark. While, therefore, the water-mark enjoys no prerogatives or privileges not shared by other agencies of commercial identification, it divulges no secret to say that in the estimation of the specialists at the U. S. trade-mark bureau, the ideal form of trade-mark is this self-same form of industrial autograph which obtains its impression by rendering the paper where the ornamental figures in wire or thin brass have been sewn thinner and more translucent than elsewhere. It is a form of branding that is unobtrusive, yet is readily discernible. It achieves that rare combination, the trade-mark that is always in plain sight, yet in no wise disfigures the product. And, by no means the least of its virtues, it is indelible, a mark that endures as long as the article which it distinguishes and which, in all cases, "carries through" to the ultimate consumer the identity which it is desirable shall be established.

Water-marks have steadily gained in favor with the majority of paper makers during a span of seven centuries because of the manifest advantage of the device traced in translucent lines in the substance of a sheet of paper and not because, as has sometimes been stated, it is necessary to employ a medium that will permit the marking of every individual sheet of paper. As a matter of fact, unwater-marked paper is not disqualified for trade-mark protection if the brand be imprinted upon or attached by labor or otherwise to the box or wrapper containing the paper. To put it differently, all the requirements of trade-mark "use," upon which trade-mark registration is based, are fulfilled if, in lieu of application directly to the goods, the mark be attached to the container which holds the goods. To water-mark the individual sheets in addition to placarding the package is, however, to make assurance of identification doubly sure. Even more persuasive to paper-marking, though, is the consideration that by this means and this means alone may identity of the product be translated to the ultimate consumer and capital made of the favorable impression gained by the general public.

Because it is the custom of librarians, collectors, antiquarians, etc., to study paper-marks for clues to intimate information regarding old books, that is, books published before the year 1800, some persons have gained the impression that the early water-marks performed a function as grade marks in the paper industry. This was not the case. The 594 types and varieties of water-marks that became current between the year 1300 and 1650, when this form of paper-marking flowered in Genoa and other early seats of the industry, served in as great a degree as does any paper-mark in use today to distinguish the product. As a matter of fact, early water-marks are studied by book sharps, librarians, etc., not because they give indication of grades of paper, but because they serve as the only true test of the size of old books.

The far-sighted paper brander of the present day desires nothing less than that the paper-mark, which he has adopted to individualize his product, should be construed by buyers or consumers as a grade-mark. For an out-and-out grade-mark cannot be sustained as an exclusive trade-mark. To be sure, the U. S. Commissioner of Patents has acknowledged that a water-mark may be both a trade-mark and a grade-mark, but that is when the attaching significance is that of a quality mark rather than a grade-mark of a type in use by the trade at large. Usually, suspicion of service as a grade-mark is fatal to trade-mark aspirations. And just here be it acknowledged that a multiplicity of paper-marks will sometimes contribute to an impression of grade-marking. Thus in the contest between the Albany Perforated Wrapping Paper Co. and John Hoberg Co., the courts held that the use of a large number of different trade-marks on a single article tended to indicate an intention to distinguish differences in quality, shape and size rather than certainty of origin.

Paper manufacturers who are cognizant of the fact that it was the private paper-marks used by the earlier paper makers that gave the trade the names commonly applied to standard sizes of paper, such as foolscap, crown, elephant, etc., need no warning against the paper-mark which, actually or in equivalent, may be adopted into the language of the trade, become generic, and thereafter be used so indiscriminately in the trade as to imperil the proprietary rights of its originator. It is perhaps with the idea of checkmating this form of complimentary but embarrassing appropriation that some of the shrewdest of modern paper manufacturers have adopted water-marks that present in combination names or initials and emblems or insignia. Even if a portion of such a mark be robbed of its individuality by trade usage, sufficient features will remain to distinguish the product of the mill.

Use of Old Foreign Marks Permissible

For the benefit of American paper marketers who would fain make use of paper-marks reminiscent of some of the earlier marks of the industry, it may be said that water-marks are not unregistrable in the United States merely because familiar in other environment. "Old in the art" is an impediment to the securance of patent rights, but this requisite of invention does not apply in the case of a trade-mark, provided the mark has not been in use in this country

by other than the trader who claims title. How the application of this principle works out has been well illustrated by the circumstance that a United States silversmith has been granted credentials by the government at Washington for the use of a trade-mark that parallels, in its most conspicuous features. the "hallmark" of the British assay office, which partakes of the nature of an official guarantee.

Applying this principle that the traditional water-marks of the paper industry are not barred from use in the United States merely on the score of antiquity, it is a fair assumption that an American paper maker might revive, in his own name, if he has no scruples, the globe and cross or the jug or pot marks that made appearance as paper manufacturers' symbols at the very inception of the industry in Holland. By the same freedom in resurrection a present-day producer of paper might, we may imagine, revert to that representation of a bull's head which the Holbein family promulgated when the members began to manufacture paper from linen rags at Ravensburg and which symbol was presumably taken from the coat of arms of the family. Latter-day appropriation of old heraldic devices, etc., is always subject, of course, to prior appropriation by some other modern Yankee tradesman who has been similarly removed to rejuvenate a forgotten water-mark.

Far from seeing any harm in the restoration to use of water-marks that were current, perhaps, before America was discovered, modern designers and trade-mark experts counsel recourse to this well nigh limitless source of inspiration. Incidentally, they emphasize the fact that no other American industry has such a treasure trove of talismans from which to draw. In various lines of trade we see a disposition to hark back to the old guild marks that were eloquent of skilled craftsmanship in bygone centuries, but no industry has such a fount to tap as have the paper makers whose predecessors were, in very truth, the instigators of modern trade-marking.

Fortunately for paper tradesmen who are taken with the idea of perpetuating the traditions of the industry by putting the old water-marks to new work, there are available fairly complete records of the old paper-marks. This is due in part no doubt to the fact that the ancient Arabs who made paper out of old ropes did not attempt paper-marking. Water-marks were unknown to the East. Instead they constitute distinctly a European improvement upon the transplanted art and are adequately chronicled in the records of Genoa, etc. Unluckily, there are fewer available examples of the early Spanish water-marks, which is to be regretted since the Spaniards are usually given credit for the invention of this most ingenious process, whereby the sign or seal of the paper maker is made an integral part of his product. The fact that the water-marks of the 14th century were crudely executed makes it necessary in most instances that the designs be redrawn for modern use, which alteration serves to satisfy any qualms of conscience over the repossession of the long-abandoned water-marks.

Although date of manufacture has been water-marked since 1545, coming into practice in the same century that saw the amplification of symbols by the use of names in water-marks, some paper manufacturers hold that date marking is objectionable on the ground that the presence of dates tends to becloud or complicate manufacturers' marks. This argument applies with all the more force now that paper makers are being urged in some instances to supplement their usual mill marks by community or collective marks of one kind or another. For example, we have the school of thought in the trade which holds that American-made paper marketed via the newly-authorized joint agency should carry not solely the private paper-mark of the individual producer but also a composite water-mark that will identify the commodity as of the group of brands that have made alliance for the sake of better distribution abroad.

First Aid

By FRED M. ROSSELAND
Safety Engineer, National Safety Council

FIRST aid has two purposes: (1) to care for an injury so that the danger to life and the loss of time is reduced to a minimum, and (2) to place the patient at ease and eliminate as much of the suffering as is possible until the doctor comes. In practice, first aid varies from the simple things which the layman can do to the expert handling of an injury by a trained nurse.

Many industrial surgeons feel that it is unwise to have any medical or surgical treatment given by a layman. It is unquestionably better to have all injuries treated immediately by a physician or a trained nurse, and this should be done in all plants where facilities can be provided. In small plants, however, which cannot afford to have a physician or a trained nurse in constant attendance many slight injuries will receive no attention unless given by a layman. This article applies primarily to such conditions.

Wherever first aid is given, the patient and the person administering the first aid should clearly understand that the dressing is temporary. The injury

should be examined and redressed by a doctor at the earliest possible moment.

Infection

One of the best indications of the value of first aid is the prevention of infected injuries in industry. Although it is not difficult or expensive to prevent or to control an infected wound, state reports received by the National Safety Council indicate that nearly ten per cent of all workmen's compensation cases are due to infection. An executive of a large metal working plant found that twenty-four per cent of their compensation claims were for infected injuries. In another examination of 5,000 accidents it was found that eleven per cent had become infected. In one industry seventy-five per cent of the loss of time from hand injuries is the result of infection. One large plant reports to the National Safety Council that with proper first-aid equipment and competent attendants it was possible to reduce the number of infected injuries in one year from 28½ per cent to 7½ per cent.

Infected injuries cause much pain and frequently result in amputation or even death. The amount of time lost is much greater than if the injury had not become infected.

To Prevent Infection

To prevent infection it is necessary to secure immediate first aid for injuries. It should be one of the rules of the plant that all injuries, however slight, must be reported and attended to. This rule will be difficult to enforce among piece workers if they must lose much time in securing first aid for minor injuries. First aid stations with competent attendants, located at convenient places, will do much to insure first aid treatment that will prevent infection and result in speedy healing.

In administering first aid, the action which resulted in the injury should not be criticized, but an attempt should be made to secure a true statement of the actual causes. If the opportunity arises, encourage the injured employe to tell how the accident could have been prevented through his own efforts. This will help to make him avoid similar accidents in the future.

Industrial first aid may be divided into three different classes: (1) administered by the injured person or by a fellow workman—to be found mostly in public utility companies where employes, singly or in small groups, work at isolated points; (2) administered by first-aid teams—used in mines and very large industrial plants; (3) administered by the plant nurse, or dispensary attendant.

First Aid Kit

The first aid kit for the employe or the small group of employes who work at isolated points should be small and compact. It should provide everything necessary for actual first aid that the layman can use. It is desirable that such employes be taught elementary first aid, using the Red Cross methods or some other methods approved by the company physician. In addition, each kit should be accompanied by a very simple, preferably illustrated, instruction book. The contents of a simple but complete first aid kit, which may be contained in a metal box approximately 7x10x4 inches, include the following:

1—Instruction book; 2—Six ampoules (vaporoles) containing 3½ per cent iodine (small size); 3—Box of toothpicks; 4—Two one-half ounce packages absorbent cotton; 5—Two one-yard cartons sterile gauze; 6—Ten-yard spool one-half inch adhesive tape; 7—Pair of scissors (three-inch blade); 8—Two rolls of one-inch and one roll each of two- and three-inch bandages (ten yard); 9—Three triangular bandages; 10—Three-ounce collapsible tube of sterile petrolatum (or similar ointment) for use in treatment of burns.

The quantity of each item may be increased if the employe or employes will be at a considerable distance from the source of supply. Items may be added if approved by the plant doctor. In adding items, however, care should be taken to avoid increasing the size of the kit and to avoid placing in the hands of unskilled employes the articles, medicines, and items which should be handled only by a trained nurse or a doctor.

First Aid Box

In plants where the majority of injuries are from cuts and scratches, simple first aid kits, containing only a one-ounce, glass stoppered bottle of 3½ per cent iodine, applicators (toothpicks, one end of each wound with cotton), and finger bandages, are hung on posts in the several departments. The bottle of iodine must be changed weekly, for the iodine becomes very strong. It may be replaced with small-sized ampoules in which the iodine never changes.

First Aid Teams

First aid teams are a necessity in hazardous work where the dispensary or hospital is at a considerable distance. The teams, consisting of five or six men, are thoroughly trained by the plant doctor or the American Red Cross in the simple but important things that they can do. They are provided with a kit that is quite complete, for, because of the time spent and the method used in training them, these teams are competent to use methods that would otherwise be employed only by a doctor. The kits have been fairly well standardized and a complete list of contents may be obtained from the American Red Cross. The kit should include a light but strong stretcher, wire splints (from four to five), a blanket, triangular bandages, picric acid gauze, absorbent cotton, half-strength iodine, toothpicks, one, two, and three-inch bandages, sterile vaseline, aromatic spirits of ammonia, a tourniquet, etc.

First Aid Cabinets

In small plants and in small shops, isolated from

the remainder of a large plant, first-aid cabinets are provided, which should contain all of the items suggested for first-aid kits and in addition, the following:

1—Wire splints (assorted sizes); 2—A bottle of aromatic spirits of ammonia (or six vaporoles); 3—Paper drinking cups; 4—A tourniquet.

Nearby, in a suitable case, a light stretcher and heavy blanket should be installed. Additions to the cabinet should be made only with the approval of the plant doctor. In general it is undesirable to include medicines, although in small plants the first-aid kit has sometimes become the medicine cabinet. The cabinet should be placed in a bright, sunny location, preferably in a room (separated from the shop) equipped with a table, couch, and washstand with hot and cold running water. The cabinet should be finished in white and be kept neat and clean. Instead of providing a first aid book, print instructions on light cardboard and post on inside of cabinet door so that they will be instantly available. The cabinet should be placed in charge of an employe with one or two alternates, and all should be carefully instructed in the use of the various articles. The instructions should be given by the company doctor, who should tell in simple language just what to do, and should require his pupils to demonstrate what they have learned, to make sure that they understand.

Training Employes

Many employers have recognized the desirability of teaching simple first aid to all of their employes or at least to a majority of them, especially those who work at night, or where a doctor or nurse is not immediately available. These instructions are given by the company doctor or by the American Red Cross, and employes are thoroughly taught the first aid treatment for cuts, scratches, burns, etc.—how to use the tourniquet, how to use a splint, how to carry the wounded, and especially the prone pressure method of resuscitation from asphyxiation, drowning, or electric shock.

Employes must be taught that, whether paid by the hour or by the week, proper first aid should be sought by them when the skin is broken, whether by a pin-prick, a burn, or a sharp edge. The fact that they have had dozens of similar injuries which have healed quickly, does not disprove the fact that lives have been lost or weeks of pain endured when such injuries have become infected. In first aid, as in accident prevention, the slogan, "The Safe Way Is the Best Way," proves to be true.

Summary

1.—First aid means immediate treatment of personal injuries by any other than a doctor.

2.—Infection (a) causes much suffering and frequent amputation or death; (b) can be prevented in most cases by proper first aid.

3.—First aid kits should be provided for employes working alone or in small groups away from possible medical assistance.

4.—Simple first aid boxes may be installed in factories if injury is kept under observation.

5.—First aid teams are thoroughly trained by a doctor or by American Red Cross and do excellent work. Used principally in remote places.

6.—First aid cabinets have a place in the small plant. If employes are properly instructed and the injury redressed by a doctor, much unnecessary pain will be avoided.

7.—Train employes to give first aid because:

(a)—Useful at work when doctor or nurse not available.

(b)—Useful at home and in public accidents until doctors or nurses arrive.

(c)—All injuries (large or small) should be dressed immediately.

Filling a Pulp Stone Cavity

By W. A. MUNRO

A PULP stone that has developed a cavity due to a sand pocket or other imperfection in the texture of the stone, a condition that was not apparent before the stone was placed in operation in the grinder room is a cause of considerable loss due to the expense not only of the labor cost but also of the lost time in removing this stone and replacing it with one that has the outward appearance of perfection. It has been known to happen that the new stone shortly after developed the bad traits of its predecessor.

An easy and permanent way has been found to fill these cavities and to make the stone's cutting surface as good as that of a perfect stone. This operation, the cost of which is negligible, saves the expense and time lost incidental to replacing the imperfect stone. This filling will last as long as the stone is of use, wearing down at the same rate as the rest of the stone.

The work of filling this cavity follows almost the same procedure a dentist does in filling a tooth. First, the hole is cleaned out. The sand is dug out and the cavity is deepened and made wider. It should be at least four inches deep, an inch or two deeper will do no harm and will insure a more permanent set to the filling. The hole should be made wider at the

bottom than it is at the top and the sides corrugated to give the filling a better hold.

The composition of the filling is the most important part of the whole operation. The cement used should be new and of the best quality. This cement is mixed with an old pulp stone that has been broken up. About 33 per cent of this broken up stone should consist of small sharp particles not larger than one-eighth of an inch in diameter. These particles give the stone its cutting ability and if they are not used, the repaired spot will glaze over causing the stone to run very hot even when sharp and it will also diminish the production from the stone.

The cement and fine stone is mixed exactly half and half, and enough water added to make a thick paste. This is put in the cavity and tamped in. All cracks and hollows in the bottom of the stone should be well filled. This fine filling should be put in only up to the point where there will be no cutting action of the stone when the stone has been worn down. From this point the filling should consist of fifty per cent cement, twenty-five per cent of fine sand or binding particles, and twenty-five per cent of coarser sand or cutting particles. This should be pounded in with a soft wood stick not as solidly as the bottom filling but enough to insure the complete filling of all the upper parts of the cavity. The filling of the cavity should be about one-quarter of an inch higher than the face of the stone, so that when the filling sets, it will not shrink below the circumference of the stone.

The mixture should set twenty-four hours to become thoroughly hardened. The rough outer surface may be smoothed off by using a coarse diamond burr and cutting the projecting surface down gradually, as too violent action of the dressing burr may render the whole job of no value.

This filling will be darker than the original stone and harder. It wears down however at the same rate and takes a burr pattern well. The production is not lessened and no difference can be observed in the quality of the pulp produced.

Improving Boiler Room Practice

The Use of Cheaper Coal, Elimination of Smoke, and Reduction of Labor through Better Methods of Combustion

By ROBERT JUNE, M. E.

POWER is one of the largest items of expense in most manufacturing businesses, and the cost of fuel represents on the average 70 percent of the cost power. And the cost of fuel is going up. Nothing short of the discovery of a new source of power can stop the rising tendency of coal prices.

Since waste in the coal pile represents dollars which should be conserved for the dividend pile, it stands the power plant operation in hand to use the most economical grade of fuel.

The first point to bear in mind is that the most economical grade of fuel varies with different furnaces and methods of combustion. As an illustration: Coal selling at a very low price per ton may be more expensive to burn than a better grade of coal under certain furnace conditions. When these conditions are changed, it may be found that a cheaper grade of fuel is the most economical and that an appreciable saving in operating costs has been effected through the improvement in methods of firing.

The furnace is the weakest link in the chain of economical steam production. The amount of coal burned to produce the results demanded is often far in excess of what would be required by careful, intelligent management. In many cases, existing plants have been re-designed for a cheaper grade of fuel, and it is today becoming quite frequent practice to design boiler furnaces especially to permit the use of a low grade of coal.

One of the conditions necessary to the efficient, and in particular the smokeless combustion of coal, is uniform liberation of the volatile gases. This is a condition which practically never can be realized in the hand-fired furnace. Inasmuch as the hand-fired furnace also presents pretty definite limitations in the way of utilizing the cheapest grades of fuel, we find that the way to improve boiler room operating conditions is to install mechanical stokers.

Advantages of Mechanical Stokers

Among the advantages attaching to the use of mechanical stokers are the following:

A—Hand firing is intermittent, and its evenness and effectiveness depends on the individual skill of the fireman and the degree of attention which he accords his work. With the automatic stoker, firing is continuous and uniformly even.

B—Cleaning of fires in hand-firing furnaces is also intermittent, often erratic, and is dependent upon the skill of the firemen. With stokers, the fires are automatically and continuously cleaned, thus insuring increased efficiency in combustion.

C—With hand-firing, there is a constant opening of doors, thus admitting large quantities of cold air into the furnace. The depth of the fuel bed is also a

variable factor and the amount of air that comes up through the fuel bed accordingly varies from one time to another. With stokers, on the other hand, it is possible to secure a practically constant and uniform supply of air, which can be controlled to agree with operating conditions.

D—With hand-firing, one fireman can at the best take care of from 250 horsepower to 500 horsepower

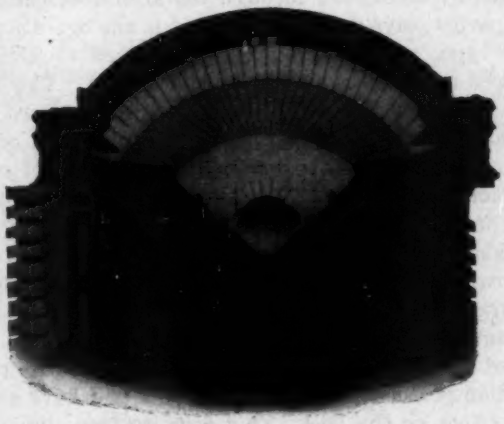


Fig. 1—Rear end view, Detroit V-Type Stoker, radially sprung arch

of boilers, whereas, with automatic stokers, one fireman can take care of 2,000 to 3,000 horsepower of boilers, hence the stokers reduce the item of labor cost 75 percent or more.

E—One of the outstanding advantages of automatic stokers is their ability to burn, efficiently, cheaper grades of fuel than can be burned to advantage with hand-firing. The importance of this factor can readily be estimated as a saving in this direction alone that may amount to enough to pay for the stoker installation several times over in the course of a year.

With hand-firing, it is next to impossible to prevent the discharge of large quantities of smoke from the stack. This is due to the intermittent character of the firing and the lack of uniformity in the liberation of the volatile gases. With the stoker, the smoke nuisance is, to an appreciable extent, within control.

The Case of a Paper Mill

The writer's attention has recently been called to two paper mills of approximately equal capacity. One of these plants has hand-fired furnaces and further, the bad conditions of this type of firing having a psychological effect on those working in the boiler room. The place was in a generally ill-kept and unsatisfactory condition. The other plant was equipped with mechanical stokers of the side-feed V-type, and perhaps because the attainment of efficiency in combustion stimulated the firemen to better work all around, the boiler room was in first-class condition. The first plant was using half again as much coal as the second, and because of the very bad features of boiler room operation, the cost of steam generation was actually twice the cost of generation in the second plant.

A study of the psychology of the fireman who labors under adverse conditions is replete with interest. Too often he works in a dimly lighted boiler room, with equipment so inefficient that any incentive he may have toward improving conditions has become buried. Where carelessness in management prevails, coal soon comes to mean nothing to him but a black substance of unlimited supply. When the storage space gets empty, coal cars or motor trucks refill it. The boss who pays for it makes no demands regarding the saving of fuel. The management's one demand is that steam should be kept up, and therefore, why should he, the fireman, who shovels coal hour after hour and day after day, be concerned with anything but the pressure gauge?

This was the condition in the first boiler room. When the management finally took up the problem of reducing the cost of steam generation, they found the firemen ready and willing to co-operate. When it was proposed to install stokers, the management found the men actually welcoming the idea, although they realized that some changes would have to be made in the number of men working in the boiler room. For this particular plant, the type of mechanical stoker chosen was one which would operate economically with the natural draft, with an auxiliary fan or blower. After the installation had been completed, it was found that a cheaper grade of fuel than had previously been used could be burned, and that, due to the uniformity with which the stoker fed the fuel, the proper proportion of air in combustion, the absence of large amounts of excess air, the self-cleaning feature of the grates, etc., that it was possible to maintain a uniform boiler efficiency of approximately

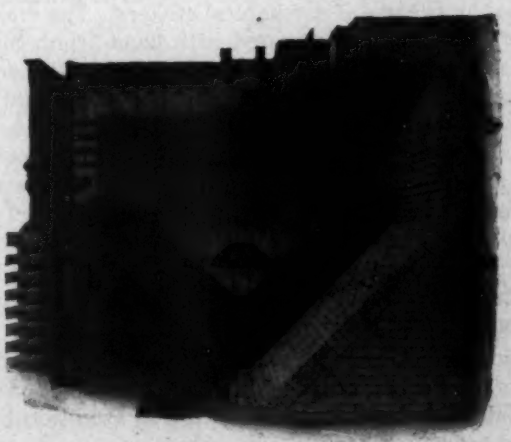


Fig. 2—Detroit V-Type Stoker with Detroit flat suspended arch

70 percent, whereas 55 percent had been the rule before, and that the same amount of steam could be generated with considerably less coal.

With the installation of the stokers, a transforma-

tion took place in the boiler room. The firemen began to display a hearty interest in their work, with the result that the esprit de corps of the operators and the whole appearance of the boiler room was changed. As a result, the cost of producing steam in the plant was reduced something like 50 percent, bringing it

Fig. 3—Before installing stokers, boiler room dirty and ill kept, efficiency low, costs high

down to the cost in the second plant. There has been no difficulty in maintaining costs at this low figure.

Standardizing Firing Practice

Daily records are essential with any method of firing, if economy is an object. These reduce to the low limit the human element. From them is derived the proper adjustment of air supply, rate of feed, and depth of fire. It should be the aim of the operating engineer to standardize his firing practice.

When a condition of smokelessness of stacks is desirable, by reason of local smoke-regulating ordinances or because of its injury to the manufactured product, the fact is that the best results can be obtained by the use of mechanical stokers. The reason for this is that, as compared with hand-firing, there is a much longer time for combustion. As the volatile gases are distilled, they are acted upon by ignition arches prior to coming in contact with the color heating surfaces. Otherwise they would fail of ignition, and pass out of the stack unconsumed. Where space permits, stokers may be installed so as to extend beyond the boiler front. This gives an added length of travel during which the gases are acted upon by the radiant heat from the ignition or supplementary arches, and are properly consumed.

Stokers, as has been stated, often reduce labor costs 50 to 75 percent or more. The slow-running, self-cleaning types require much less attention than hand-fired furnaces.

For boilers operating up to 200 percent rating, the side-feed, V-type stocker such as the Detroit, illustrated herewith, makes a desirable and economical installation. It possesses a much larger coking area than the other types of stokers. As the combustion area is likewise very large, it is possible to secure complete and practically smokeless operation. It operates with a natural draft.

Two magazines, located on each side of the stoker, supply the coal. Coking plates are inclined at a steep slope toward the center of the furnace. As the coal leaves the magazines, it rests for a short period on the coking plates. During this time the volatile gases are driven off and mixed with air which has been preheated by admission through the arch over the fire.

Gravity plays an important part in the operation of this type, and little power is required to actuate clinker crusher and oscillate the grates. The fuel travels slowly down the inclined grates toward the clinker grinder, receiving the requisite amount of air through the grates to complete the process of combustion. By the time the lower portion of the grate is reached, the combustion is completed, and ash and clinker are removed automatically. Maintenance cost is low, due to the small number of parts coming in contact with the fire.

Stoker boxes push the coal into the grates. The speed of this operation is easily regulated. As combustion proceeds, the grates oscillate and have a slicing effect on the fuel. This permits free admission of air and assures complete combustion. In stokers of this type, the clinker grinders can be adjusted to operate independently of the remainder of the mechanism. If the coal contains a large amount of ash and clinker, the grinder may be adjusted to operate faster, to remove them. At the same time, the coal may be fed at a slow rate if desired.

Results of Stoker Tests

The savings in coal effected by the use of mechanical stokers are very large. This result is to be expected in view of the fact that stokers increase the overall boiler efficiency from the general average of 55 per cent for hand-fired furnaces, to a general average of 70 percent for stoker-fired. As indicative of

Fig. 4—After installing stokers, boiler room clean and neat, efficiency high, costs low

the boiler efficiency readily obtained from the use of mechanical stokers, we include Table I, which shows results of a test at normal rating on Detroit stokers at a well-known paper mill.

TABLE I

Test on one Detroit V-type stoker manufactured by D etroit Stoker Company, Detroit, Mich., on one H. R. T. boiler 66 inches by 18 feet (Vogt).

Horsepower of boiler (owner's rating)	120 horsepower
Size of stoker	4 feet 11 inches by 5 feet 3 inches
Grate surface	27 square feet projected
Kind of fuel	Kenewa gas coal slack
Duration of trial	8 hours
Total Quantities	
1—Duration of trial	8 hours
2—Weight of coal as fired	3,756 pounds
3—Percent of moisture in coal	5.38 percent
4—Total weight of dry coal fired	3,384 pounds
5—Total ash and refuse	463 pounds
6—Percent of ash and refuse in dry coal	13.7 percent
7—Total weight of water fed to boiler	32,508 pounds
8—Factor of evaporation	1.083
9—Equivalent of water fed to boiler from and at 212 degrees	35,206 pounds
Hourly Quantities	
10—Dry coal fired per hour	423 pounds
11—Dry coal per square foot of grate per hour	15.66 pounds
12—Water evaporated per hour	4063.5 pounds
13—Equivalent water per hour from and at 212 degrees	4400.7 pounds
Averages and Temperatures	
14—Steam pressure by gauge	99.6 pounds
15—Temperature of feed water	170.3 degrees Fahr.
16—Temperature of flue gas	507 degrees Fahr.
17—Force of draft in breeching	
18—Force of draft over fire	10 inches
Horse Power	
19—Horse power developed	127.5
20—Builder's rated horsepower	120
21—Percent of builder's rating developed	106.3 percent
Economic Results	
22—Water evaporated per pound of coal as fired	9.09 pounds
23—Equivalent evaporation from and at 212 degrees per pound of coal as fired	9.84 pounds
24—Equivalent evaporation from and at 212 degrees per pound of dry coal	10.40 pounds
25—Equivalent evaporation from and at 212 degrees per pound of combustible	12.05 pounds
Coal Analysis	
Moisture	4.38 percent
Volatile carbon	
Fixed carbon	
Ash	10.0 percent
B. T. U. of coal as fired	13.088
B. T. U. per pound of dry coal	13.833
Efficiency	
Efficiency of boiler, including stoker, based on dry coal	72.6 percent

Details to Be Remembered in Handling Stokers

Mechanical stokers are a good-paying investment and they are badly needed in large numbers of plants where they are not now used. Do not think because you operate a small boiler that you cannot use a stoker advantageously. If your boiler plant is small, you may not effect a large saving in labor by the use of a stoker, but you can gain greatly increased boiler efficiency, save fuel, and correspondingly lower your operating costs.

After your stoker has been installed, the first thing to do is to determine standard practice for firing. A little experimental work done by one of your competent engineers will enable you to lay down the rules to be followed in handling your stokers. After the

Fig. 5—Stoker installation in one of the large central stations

standard practice has been formulated, it should be typewritten and placed at one or more points in the boiler room, and the work of the fireman should be checked regularly. Remember that rules are of value only if they are followed.

Be sure that the following points are embodied in your rules for stoker operation:

A—Keep draft under close control at all times. It is desirable to use draft gauges with all types of stokers.

B—See that your air vents are kept open, so that there will be no obstruction to the passage of the air.

C—Do not allow air leaks, which may develop in the furnace, to remain unattended to.

D—See that the ash pit is cleaned out regularly at frequent intervals. Check up the CO_2 in your flue gas regularly. If the percentage falls below standard, find out why.

E—Remember that coking coal may require the use of a slice bar.

F—Do not, under any circumstances, get water upon the arches or brick-work when you are washing out the boiler.

G—Do not stop the stoker engine when hopper is full of coal. If an emergency stop is necessary, clean out the hopper.

H—Attend to all maintenance work promptly and your repair bills will be small.

In conclusion, if you wish a high standard in boiler room practice, equip your boilers with the necessary apparatus and assure yourself that your operatives are sufficiently familiar with the equipment in the plant to handle it intelligently under varying conditions of load.

Relation of Business Statistics to Management Control

By STEPHEN GILMAN, C. P. A.
Chairman, Board of Directors, International Accountants Society, Inc.

Presented at the Meeting of the Kalamazoo Valley Local Division of the Cost Association of the Paper Industry, Held on April 25, 1921, at Kalamazoo, Michigan

IN ANY small business management, control is direct because all functional activities are continuously under the observation of the proprietor.

But as soon as the business grows to such a size that the proprietor can no longer maintain personal direction over every activity, it becomes necessary for him to relieve himself of some of his duties and responsibilities by delegating them to certain employes.

At this point departments are created, each to perform a specific function. The business has been split into a number of smaller specialized businesses —the original proprietor has created sub-proprietors, each responsible for a specialized phase of business activity.

Having transferred to others, parts of his own managerial functions, the original proprietor is no longer in direct touch with delegated activities. At this very point arises the need for a system, or method of managerial control.

When a proprietor works through department heads, he is dependent upon them for information as to progress made and results accomplished within their departments. In order that this information may not be prejudiced nor haphazard, it is customary to create one department whose duty it is to maintain a complete record of all departmental activities and to report thereon periodically according to some organized predetermined plan.

This department may be known variously as the Accounting Department; Auditing Department; Comptroller's Department; Bookkeeping Department. In order to appreciate fully the duties and responsibilities of an accounting department, it is necessary to have a clear understanding of the relationship between any department head and the management.

When a proprietor delegates authority—transfers to another some of his own original duties, responsibilities and powers—he enters into an agreement, either positive or implied, with the new department head.

Thus if a sales department is being organized and a sales manager put in charge, there is a positive or implied agreement between the sales manager and the proprietor that the sales manager undertakes to secure certain results (make sales in a certain required volume at satisfactory prices) at a reasonable cost. In other words, he is serving as a proxy for the proprietor and is presumed to act as the proprietor himself would act with respect to sales policies.

On the basis of this understanding the proprietor bestows upon him certain authority in order that he may have the power to accomplish his delegated duties.

The delegation of responsibility and the delegation of authority must always go hand in hand—the one without the other is meaningless.

If business were conducted on an utopian basis, the proprietor could then forever banish the sales function from his mind.

Unfortunately he may not do so for at least two good reasons:

1. The department head may fail to accomplish the desired results.
2. He may accomplish them but at excessive cost.

It is necessary, therefore, that the proprietor keep control of each such department, and this he does through the accounting department.

The accounting department is the "scorekeeper" of business. It accumulates information about business activities, not at random, but according to a plan which classifies the data for the proprietor's ready use.

Interest in People, Not Things

The proprietor is interested in people, not in things. He is interested in knowing how his department heads are fulfilling their obligations to him.

He works according to an old, old law which is fundamental to executive success—the law of human responsibility (for results and costs) and accountability (for values entrusted).

He works through John Jones, manager of the credit department, or Will Smith, superintendent of the power plant, or John Brown, foreman of the lathe department.

And he wants his information classified, not according to things, but according to the human beings whom he directs.

As a fundamental question of efficient manage-

ment, he is not interested in learning that the expense of operating the boiler room has increased in a certain month. His interest is in Will Smith, to whom the boiler room functions were delegated, and who is responsible for an explanation of that increased expense.

It is Smith's and Jones' and Brown's records that he is first interested in and not in steam consumption or credit loss or other similar information. The proprietor does not directly control results. To obtain desired results, he must first control the human agencies directly responsible for accomplishment.

The accounting department, therefore, must classify this information according to people. This means that a classification of accounts is required which will articulate with the organization chart of the business—an account or group of accounts for the departments under the sales manager; an account or group of accounts for the departments under the purchasing agent, etc.

Through the classification of accounts is collected data bearing on the financial side of business activity. Most of this information has to do with expenses; some of the information as illustrated by the sales accounts has to do with results, but from the financial viewpoint only.

At this point the average accounting department stops. Each month it furnished to the management comprehensive, comparative reports reflecting the costs of departmental activity, but little or nothing about the results.

If for control purposes the management requires that departmental costs be accurately measured, it requires equally that departmental results also be measured and reported.

Of what aid is it to a manager to learn that his central stenographic department cost $800 this month as compared with $650 last month. Such expense date alone affords no basis for control. What did the business get in the way of results from that department—how many letters were turned out this month as against last month?

On a total expense basis only, the department head appears subject to censure; but on the basis of the departmental expense per unit of output he may be due for a raise in pay.

Data regarding departmental expense plus data regarding departmental results considered together furnish the executive an effective instrument of control.

Statistical Production Reports

The accounting system reports the classified costs. The statistical system must report the operating production data. These statistical production reports are commonly found in connection with manufacturing activities and indeed form the basis of what is often called the "process plan" of cost accounting. They are infrequently found in office departments for a number of reasons, each of which justifies brief consideration.

Any production department of an enterprise operating on the "process plan" is ordinarily engaged in producing but one commodity. By measuring, weighing or otherwise ascertaining the total of that departmental production for a month and dividing that production into the total departmental expense for the month, an accurate unit cost is obtainable. In most office departments, however, the production is not simple but is "mixed"—composed of a number of diverse kinds of units.

The situation can only be compared to a factory department making both chairs and wheelbarrows. If, in a month, 190 chairs and 610 wheelbarrows, or a total of 800 were produced and the departmental cost for that month was $4,000, is the unit cost $5?

And if the cost next month is $4,500 and the production is 330 chairs and 550 wheelbarrows, should the foreman be congratulated or "called on the carpet?"

Do these illustrations seem foolish? They are no more foolish than incidents happening daily in almost every office where departmental mixed production is the rule.

If by a series of tests, it could be definitely established that the making of three chairs is equivalent to the making of two wheelbarrows, then the mixed production could be expressed in terms of simple production, i.e., wheelbarrow production being divided by two and multiplied by three and added to chair production.

	April		May	
Chairs produced		190		330
Wheelbarrows produced..	610		550	
Multiplied by	3/2	915	3/2	825
Total production (expressed in chairs)..		1,105		1,155
Total cost		$4,000.00		$4,500.00
Unit cost		$ 3.62		$ 3.89

A similar plan of simplifying mixed production may be used in some office departments under proper conditions.

Among the more important conditions, we know that the departmental operations should be largely repetitive and that the production should not be too mixed.

If these conditions exist production tests may be conducted in order to obtain a "rate per hour per operator" for each kind of production. These tests should not be superficial, but should be sufficiently extended that the resulting averages reflect the approximate truth.

By using the averaged rates per hour, an artificial

unit of production, which we may call the "point," may be obtained.

This "point system" of securing comparable production statistics is at best only moderately accurate and depends for its integrity upon uniformity in operating conditions and working methods.

The second reason why proper production statistics are seldom available for office operations is because the volume of work done in a department is often not under the control of that department head. Consider, for example, the activities of a credit department. Its production, which consists primarily of "approved orders," is under the control, not of the credit department but of the sales department. If the sales department fails to secure the orders the credit department is out of work through no fault of its own.

It would clearly be unfair to use such production statistics as any measure of the credit manager's efficiency.

Every business has departments of this type. Each offers a separate and peculiar problem. Each is capable of a solution—a rough solution perhaps, but still better than none.

And it should also be remembered that even if the management should not use the production statistics of such departments for the direct purpose of measuring the value of department heads, the statistical information may still prove collaterally valuable for management purposes, i.e. the wide fluctuations in the sales production may be curable.

Generally speaking, when the production of any department is not under its own control, the production statistics should still be collected as a check against the departmental expense. Even though the production may not be controllable, the departmental expense is, and the production statistics may well serve to point out when and where to retrench.

The third reason for lack of production statistics for office departments, is found in the ignorance of statistical methods among accountants.

Statistics is not a highly technical subject (save on the mathematical side which is almost never needed for current business purposes). Statistics is merely a logical, reasonable, common sense way of handling and interpreting figures. Since bookkeepers and accountants deal with figures almost exclusively, it seems strange they should be ignorant of some of the simplest statistical methods.

This condition may call for the establishment of a separate statistical department—a plan which is becoming increasingly popular.

However, it is not the ideal situation, unless, to be sure, such a statistical department is under the control of the chief accounting officer.

Because accounts (reflecting costs) and statistics (reflecting results) are twin instruments of management control, they should be articulated. Because they refer merely to different phases of the same activities they should be centrally administered.

The remedy for lack of statistical knowledge in the accounting department is not the establishment of a separate department. Rather it lies in training of accounting employees.

And this is the simpler solution. The statistics of business are neither difficult nor tedious to learn. The mastery of simple statistical methods by the accountant will multiply his value to himself and to his employer many fold, because it makes a complete business interpreter and analyst of him instead of a mere glorified bookkeeper.

Simple Method for Testing the Relative Strengths of Dyes

By B. K. STEADMAN

MOST large paper manufacturers who make colored papers have well organized laboratories where their dyestuffs can be tested for strength, purity, etc. This is the best and most accurate way for making these tests, but when it does not seem advisable to go to the expense of buying miniature paper making machinery for this purpose, the following method will prove quite accurate.

Assume that a pink paper is being made with a known grade of Safranine and we wished to test a new and unknown brand of Safranine with the known one. We would weigh out equal amounts of these dyes and make each one up to the same volume with clear water (preferably distilled). The amount of color in any given volume of water can then be easily calculated. Example:—Suppose 1 quart of water contained .5 oz. of dye, then 1 oz. of water (liquid ounce) would contain .0156 oz. of dye (1 liquid quart = 32 liquid ounces). Now if the above paper is being made with 50% rag stock and 50% bleached sulphite, and 16 oz. of Safranine are being used per 1000 lbs. of air dry stock; then to make laboratory samples on the same basis, we could use 1 oz. rag stock, 1 oz. sulphite (both air dry) and .002 oz. or .057 grams of dry color, or its equivalent in water. In the same manner the amounts of filler, mordants, etc., would be figured.

The stock is shaken in a fruit jar containing some water and small pebbles, or shot, and then transferred to a big bowl with a definite amount of water.

The color, size, filler, etc., are added in the same order as on a mill run, and all are then well mixed with an egg beater or something similar.

Some of the pulp is then poured on the edge of the Fourdrinier wire and covered with a piece of dry soda pulp (smooth side down) and run through the couch rolls, then through the first press rolls. It is dried by hand on one of the dryers, and is finally calendered.

I have made numerous tests in the above manner and have compared results with paper made in the mill on a large scale. There is little difference between the shades of paper made in each case if equivalent amounts of the various dyestuffs, mordants, etc., are used and if proper precautions are taken.

To carry out the above test, the following should be had:

(1) An accurate chemical balance.
(2) Some porcelain cups or several glass beakers.
(3) A small watch glass in which to weigh the samples of dye.
(4) A large bowl.
(5) Several graduated flasks (glass).
(6) Several measuring graduates (a few pipettes would also be useful).

Useful Information for Power Plant Owners and Engineers

By W. F. SCHAPHORST, M. E.

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Value of Low Chimney Gas Temperature

TO save as much coal as possible, one of the things necessary in the power plant is to maintain the lowest practical temperature in the chimney or waste gases. Hot gases are useful for creating natural draft, but they are very wasteful. It it usually more economical and better to install a mechanical blower for creating forced draft and exhausting the waste gases into the atmosphere than to allow those gases to pass away at a temperature of 600 degrees F. or thereabouts. Engineers therefore are advocating the use of temperature recording instruments in the boiler-room for keeping a record of the waste gas temperature. If this temperature runs up to 600 degrees or even 550 degrees there is a loss. It is the duty of the engineer to see to it that a low and efficient temperature is maintained.

The best way to maintain low waste gas temperatures is to keep the boiler tubes clean both inside and out. Keep the soot deposits off the outside. Keep the scale deposits off the inside. By doing this the tubes are enabled to transmit heat easily and the temperature of the gas will approach the temperature of the water in the boilers. It is impossible, to be sure, to maintain a lower temperature of waste gas than the temperature of the steam being generated without the additional use of an economizer, a mechanical draft equipment, or some kind of interchange system. The day will doubtless come when in large power plants the waste gas temperature will be very close to the initial temperature of the feed water, which is frequently real "cold."

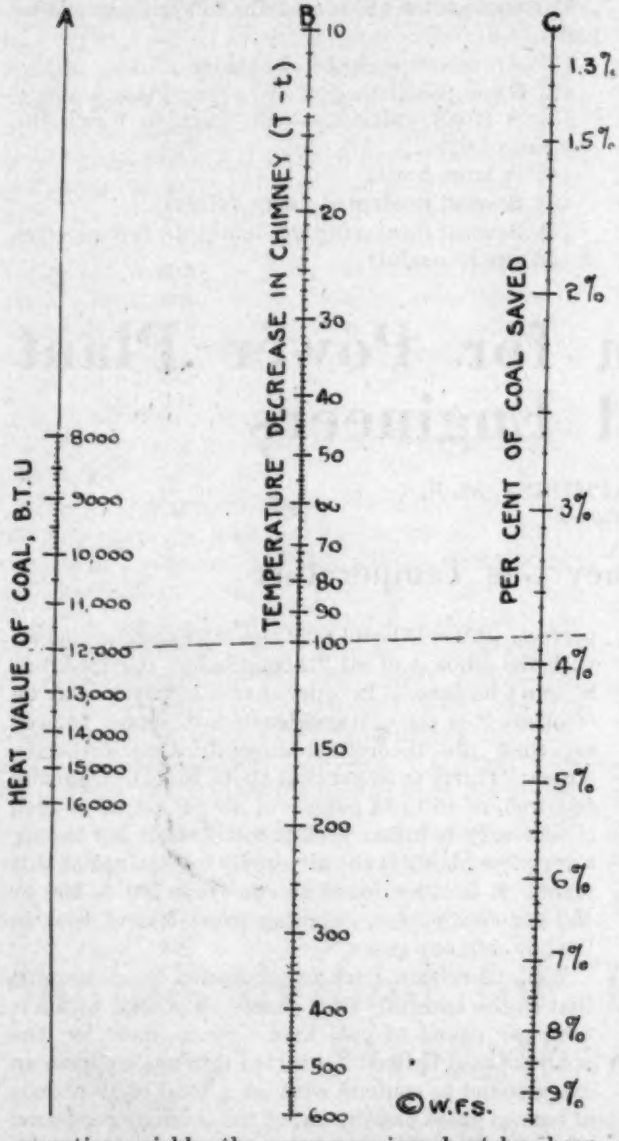
If the combustion of coal were a "perfect" process, this chimney loss would not be so serious a matter. Sad to relate, though, combustion is invariably imperfect. It would be mighty nice if we could get along with the amount of air "theoretically" required, but it "can't be done." In order that combustion may be complete it is the universal custom to supply "more" air than the theoretical amount. One authority states: "Thirty to 50 per cent above that theoretically required, or 16 to 18 pounds of air per pound of fuel, is necessary to insure perfect combustion, but in only a very few plants is the air supply maintained at this point. It is often found to run from 100 to 200 or 400 per cent excess, entailing great loss of heat in the hot chimney gases."

Well, to refrain from exaggeration let us assume that in the carefully fired plants 18 pounds of air is used per pound of coal fired. Since most of the pound of coal is itself converted into gas we have an extra pound to contend with, or a total of 19 pounds of burned gases passing out of the chimney per pound of coal fired. The specific heat of this gas is usually taken as 0.24. That is, twenty-four hundredths of a British thermal unit is required to raise the temperature of one pound of the gas one degree Fahrenheit. So, multiplying by 19 we get 4.56. Now multiply this by the "excess" temperature that is being permitted. The excess temperature is the actual temperature of the waste gases "before" the tubes are cleaned, minus the actual temperature "after" the cleaning, or (T-t). Thus if the temperature before cleaning is 600 degrees F., and after cleaning 500 degrees F., the difference or excess is 100 degrees F. Multiplying by 4.56 we get 456 heat units lost per pound of coal fired.

Lastly, divide this by the heat value of the coal per pound. Thus if the heat value of the coal is 12,000

b. t. u. we get 456 ÷ 12,000 = 0.038. In other words the loss is 3.8 per cent.

To assist in performing the above mathematical



operation quickly, the accompanying chart has been prepared. It is based in the cited figure—18 pounds of air per pound of coal which is necessary to insure thorough combustion.

By simply laying a straightedge across the chart connecting the heat value of the coal (column A) with the temperature decrease (T-t) shown in column B, the inter-section of the extended line with column C gives the coal saving in per cent.

The dotted line drawn across this chart shows how the problem solved above is worked out via the chart. Column C, it will be noted, gives the answer as 3.8 per cent.

The range of the chart is great enough to cover any ordinary power plant condition—any coal and any probable temperature decrease. But it must be remembered that the chart is "very conservative" and that is most plants and probably all plants the loss is greater than shown by the answer obtained in column C, because of the fact that in actual practice a greater excess of air is used than 50 per cent.

A permanently installed soot cleaner will keep the outside of the tubes clean at all times, provided, of course, the engineer takes enough interest in his plant to turn on the steam three or four times per day and swing the soot-cleaning elements around. It is a very simple and convenient process—much superior to the old hand lance method. There is about as much difference between the old and new methods as there is between inefficiency and efficiency. The hand lance method is inefficient because it is not thorough, because the boiler must be shut down, because it is dangerous, and because it is hard, distasteful work.

The effect of scale removal is the same as the effect produced by cleaning off the soot. It gives the heat a chance to get through, thus lowering the temperature of the waste gases. To remove scale effectively, there is no better method than via a boiler tube cleaning machine, used regularly. Mechanical cleaners have been greatly improved of late and no power plant should be without one. Manufacturers are so sure that cleaners of this kind will give satisfaction that they send them out for free trial without obligating the prospective purchaser in any way.

The writer would suggest that a soot cleaner and scale remover be tried out fairly. Measure the temperature of the flue gases "before" cleaning, and again "after" cleaning. Subtract and then use the chart. You will doubtless find the cleaner to be a paying proposition. You will gladly send the manufacturer your signed check.

What Size of Belt?

DOUBLE belts cost twice as much as single belts of the same width. But, they do not transmit twice as much power as single belts. Naturally this gives the single belt the advantage in a great many cases as it justly should. Yet, I have never known this cost relation to be considered in the selection of a belt drive for a given purpose.

Usually the designer looks over his plans, and if it

What Size of Pulley?

"seems" that a double belt should be used he specifies such a belt without first making comparative computations. If the power to be transmitted is small, if the drive is unimportant, and if costs must be as low as possible the designer usually "guesses" that a single thickness belt will be "good enough."

To illustrate the point and thereby make it more emphatic, let us take a simple case where 50 h. p. is

to be transmitted from a 4 ft. pulley to another 4 ft. pulley, the distance between shaft centers being 30 ft. I am a believer in large pulleys, in most cases, and in high belt speeds. Large pulleys don't slip so easily, are often more economical because they permit the use of narrower belts, and the pulling stress on the shafting is correspondingly less. So, all in all, large pulleys and high belt speeds generally make the most efficient and most economical combination. We will therefore use a belt speed of a mile a minute, which is permissible with good cast iron pulleys.

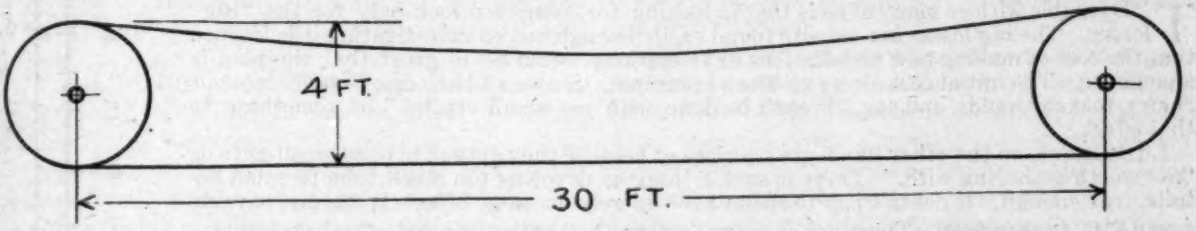
At that speed, each inch in width of single belt will transmit

$$5280 \div 800 = 26.6 \text{ h. p.}$$

And each inch in width of double belt will transmit

$$5280 \div 500 = 10.56 \text{ h. p.}$$

From this we find that the single belt will have to



be $(50 \div 6.6)$ eight inches wide, and the double belt $(50 \div 10.56)$ five inches wide. These will require 9 in. and 6 in. pulleys respectively. The costs of these pulleys to the trade are $14.60 and $30.30 respectively for one, or $29.20 and $26.60 for the pair. The pulleys for the single belt will therefore cost ($29.20 — $26.60) $2.60 more, which is not very much considering the size of the drive. This will be more than counter-balanced by the money saved through using a single belt instead of a double belt.

Referring to Fig., it is clear that the length of belt will be $[(2 \times 30) + 4\pi]$ 72.5 feet. Now, since all belting catalogs give prices on belts per foot for all standard widths we can easily arrive at the costs of our belts. I find that the single belt will cost $62.30; the double belt $78.40. The double belt will thus cost ($78.40 — $62.30) $16.10 more.

The overall saving through use of single belt will therefore be ($16.10 — $2.60) $13.50, which is certainly large enough to be considered.

It is evident that the greater the distance is between shaft centers, the greater is the saving with single belts. But where the distance is small the difference in cost is slight and at certain distances in any drive the costs will be equal mathematically. Practically, though, such distances are often impossible, as in the example just cited, where I get a distance of (— 0.4 ft.) as the distance at which costs would be equal. I do not know how such an arrangement would look, nor does anybody else, for I have never seen shafts set at a "negative distance" apart. I get a negative result here because the excess cost of the double belt in merely wrapping around the 4 ft. pulley would alone be more than $2.60, the pulley saving.

The double thickness belt has an advantage where space is expensive, of course. Very often a single belt might cause additional expenditures due to its greater width, in which case such expense must be considered. It would hardly be good practice, for instance, to use a wide single belt for the sake of economy and at the same time make the sheltering building a foot or so longer just to house the belt. Usually, though, we are not so cramped for space, and we can use either a double or single belt or we can use a three-ply belt if our judgment and computations tell us to do so.

All of these little things should always be considered, especially where a large number of belts and pulleys are used. Good single thickness belts give excellent service where they are properly care for. Double belts need not be used simply because it "sounds" better to say to visitors, "Our drives are all equipped with double and triple-ply belts. We haven't a single-ply belt in the house."

The drive that is ultimately the most economical is always the best.

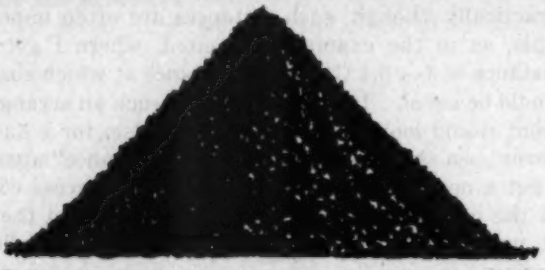
We often read inflexible statements with reference to belts, that a double or triple belt must be used on such and such a pulley or on such and such a drive. Statements of that kind are often far from the truth. I am not stating here what is BEST. I merely submit these data for your consideration and you may use your own judgment.

How Many Tons in a Conical Pile of Anthracite Coal?

BECAUSE of the fact that when anthracite coal is piled loosely on the ground or on a floor it assumes a fairly definite angle of repose, we can easily develop a formula for computing the number of tons in a natural conical pile. The weight of anthracite per cubic feet is fairly constant quantity also, which makes the development of the formula still easier.

Such a formula has been developed, but it involves squaring the diameter of the base of the pile and multiplying by a constant. To make the method as easy as possible the writer therefore constructed the

accompanying chart which gives the tonnage direct by simply glancing across from column A to column B.



For example, how many tons of anthracite coal in a conical pile whose base diameter is 30 feet?

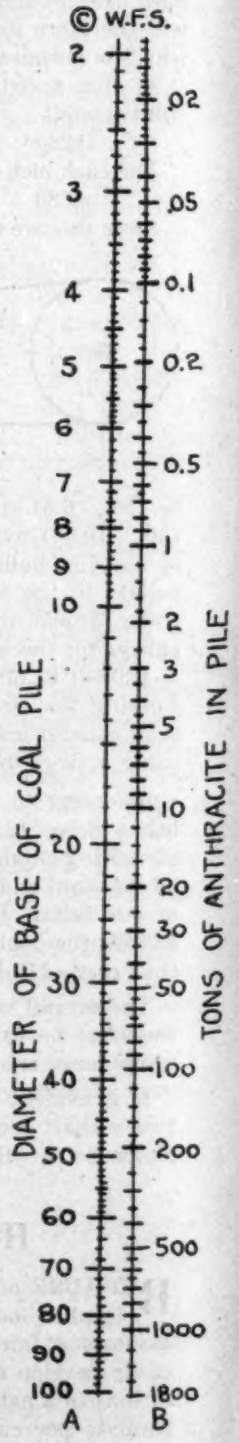
Find the 30 in column A and glance across to column B and there's the answer—about 48 tons.

Inversely, the chart can be used to determine the size of plot needed for the storing of a given amount of anthracite coal.

For example, what size of plot will be needed for the storing of 200 tons of anthracite coal?

Find the 200 in column B and glance back to column A. The answer is—about 49 feet.

The range of the chart, it will be noted, is great enough to take care of most ordinary piles. It varies from 2 to 100 ft. in diameter. In a 100 ft. pile there would be about 1,800 tons.



Little Losses

THE trouble with so many of us is that in looking for losses we look only for the "Big" losses. The big losses are usually found easily enough but on investigating it is learned that the cost of making new installations or alterations would be so great that the plan is abandoned. The initial cost looms up like a mountain. So, we sit back comfortably into our chairs, fold our hands, and say, "It can't be done with my small capital," or something to that effect.

Little losses, on the other hand, are overlooked because they appear to be so small as to be "not worth bothering with." There is such a thing as devoting too much time to small details, true enough. It doesn't pay to spend $100 merely to save $100. It hardly pays to spend $100 to save $106. There are so many factors that enter into industrial problems—labor, interest, depreciation, rent, overhead, etc.—that accurate computation is difficult and usually impossible.

However, it is a pretty safe bet, in most establishments where power is used, that the simple little losses when added together amount to more than the single big loss that, because of its bigness, can be plainly seen. Besides, the cost of eliminating the small losses may amount to considerably less than the cost of eliminating the big loss.

The writer is more familiar with power transmission by belts and ropes than with most other mill equipment, hence his mind usually thinks in terms of belts, ropes, shafting, pulleys, etc. Nevertheless the little losses in other departments are of equal importance. There is too much lost motion wherever you go. Too much friction not only between shaft and bearings but between human beings.

For example, a foreman finds that a machine isn't running fast enough. It is 5 per cent too slow. He cannot speed it up faster because it was made for one speed and only one. The foreman may not know it, but in addition to the 5 per cent production loss there is a 5 per cent power loss. The driving engine or motor is doing just as much work as though it were pulling a full load. The actual load of the driven machine plus the power loss due to belt slip is equal to the full normal load without slip.

However, the foreman knows or feels that production could be increased by spending a few cents to treat the belts and make them pull without slipping. Or, he would spend a little more and use some larger pulleys. He knows that large pulleys are not so liable to slip.

He therefore goes to the superintendent and suggests the improvement. The superintendent, however, is a balky person and he "lays down." He tells the foreman that the foreman doesn't know what he's talking about—that everything is O. K. aside from the slight 5 per cent production loss. He says to the foreman, "If we wanted to increase the speed by that 5 per cent we would buy a larger driving pulley for $30, but it wouldn't pay. It's too much trouble."

There the matter rests. In the above case a new $30 pulley wasn't needed at all. About 5 cents' worth of belt treatment would have put the belt in proper condition to do full work without slipping.

The superintendent, you see, proposed to spend $30 and at the same time continue to pay for the constant power loss of 5 per cent, which might amount to another $30 per year, plus the cost of wear and tear on the slipping belt.

Little losses, surely, are worth investigating and stopping if it is possible to do so at slight expense.

Pulp and Pulp Wood Decay

Preliminary Report Published by the American Paper and Pulp Association

THE problem of saving many millions of dollars by preventing decay of pulp and pulp wood has resulted in a two years' study by the United States Forest Products Laboratory at Madison, and the results have been published in the following preliminary report by the American Paper and Pulp Association, which participated in the cost of the investigation.

The amount of loss annually from decay of pulp and pulp wood in storage has been variously estimated, but few estimates have placed the total at less than $1,000,000 a year, by the destruction of raw material which otherwise would have been converted into paper.

In August, 1919, the Forest Products Laboratory, co-operating with the Bureau of Plant Industry, United States Department of Agriculture, started an investigation of the deterioration under commercial storage conditions of wood and pulp used in the manufacture of paper and fibre products. This was done at the urgent request of mill operators who were suffering heavy losses, particularly in the storage of groundwood pulp. In February, 1920, an adequate fund for continuance of the study was subscribed by a group of mills, mainly located in Wisconsin and Minnesota but ranging as far east at Maine. The study has now progressed for nearly two years.

The major features upon which the attention of the laboratory have been focused have been the improvement of wood storage practices and the preservation of stored pulp. Prevention of decay and molding in stored pulp has been attempted by adding antiseptics to the pulp as it goes over the wet machine, or, as in the case of much of our experimental work, by adding the chemicals to the wet laps after removal from the wet machine. The present paper deals only with these preservative treatments.

The preservative action of 106 different chemicals has been investigated. In selecting these their cheapness as well as their probable efficiency were taken into consideration, but a considerable number were included solely because of their comparatively low cost.

In applying these chemicals the principal laboratory method consisted in running off on a small wet machine laps of fresh groundwood pulp about 21 inches long and 12 to 14 inches wide. After the ends were trimmed, these were laid out in groups of ten and sprayed on both sides by means of an ordinary 2½-gallon compressed air garden sprayer operated by hand.

The concentration of solution used depended in large part on the solubility of the chemical, but where the antiseptic value was doubtful and the substance easily water soluble in the desired amount 5 per cent solutions were used in the preliminary tests. In later tests on substances which looked promising the concentrations were in many cases reduced.

Moisture determinations on the laps showed them to be about 30 per cent dry before spraying.

The laps were separated into bundles of seven and three, respectively, the bundles being weighed both before and after spraying in order to determine the amount of solution absorbed. These data, however, were not secured for the first three series comprising about 300 laps.

Although the amount of solution used was measured, the quantity of chemical actually absorbed was determined by the increase in weight of the bundles after spraying, since a considerable amount of preservative was lost during the process of application.

Each bundle of seven laps was inoculated profusely with a mixture of mold spores by shaking a heavy water suspension of the spores upon the laps from an atomizer bottle immediately after spraying. The bundle of laps was then folded once.

Each bundle of three laps was inoculated with wood-destroying fungi only, using five pieces originally isolated from decayed pulp. These fungi were grown on agar in petri dishes and small squares of the agar with growing fungus were applied to the surface of the laps at five points in each of two laps. These bundles were also folded once.

At the end of a day's run the bundles of laps were taken to a storage house in which the air was kept highly humid and the temperature regulated around 72° to 75° F. The bundles of seven were for the first few months closely stacked on narrow shelves with one or more untreated laps separating the treated bundles. Occasional bundles of untreated test laps were interspersed to serve as checks or blanks.

For the last ten months of the test, however, the bundles were repiled with thick laps of very rotten hydraulic-pressed pulp separating each layer so as to give a more severe infection.

The bundles of three, inoculated only with wood-destroying fungi, were piled on separate shelves, separated only by laps of clean untreated pulp.

Tests on the more promising preservatives have been repeated several times using the same or lower concentrations. In addition to the laboratory tests a small semi-commercial test involving about one ton of wet pulp was made at a Wisconsin mill, treating usually three laps with a given preservative or concentration on the wet machine by dripping the solution on the pulp just before it reached the rolls.

In all, about 3,000 small groundwood and 1,400 small sulphite laps have been tested in addition to sixty-one commercial laps treated at the mill.

The mill tests have now run six months and the older laboratory tests date back to August, 1919, while the latest had been running nearly eleven months at the time of the last inspection.

Of the 106 chemicals tried, seven had proven worthy of mention at this time. A discussion of these follow.

BORAX

This is a white substance 5.3 per cent soluble in water at 70° F., or 7.4 per cent at 86°F. It is non-poisonous and therefore safe for workmen to handle. It slightly darkens the pulp, but not to an objectionable degree.

The following amounts of pulp were treated:

5 Per Cent Solution.
64 small laps groundwood.
175 lbs. of commercial laps of groundwood at mill.
20 small laps sulphite.
10 Per Cent Solution (Hot).
30 small laps groundwood.
225 lbs. commercial groundwood at mill.

The small laps treated with 5 per cent solution contained approximately one pound of chemical per 100 pounds of wet pulp; those treated with 10 per cent solution, contained up to 1.7 pounds.

Results—The 5 per cent solution applied at the laboratory held the pulp in good condition (slightly molded in a few cases) for six to eight months. The 10 per cent solution kept it clean or nearly so for six months.

After thirteen to fifteen months the 5 per cent treatments were in fairly good condition, although some mold and probably wood-destroying fungi were present.

The 10 per cent solution showed no particular advantage over the 5 per cent.

The mill tests with a 5 per cent solution dripped on the pulp back of the press rolls were not as favorable, since the pulp was severely stained with blue-black molds within six months. This may be due to the actual concentration of the chemical in the pulp being considerably lessened by the method of application, the chemical being partly lost in the white water at the press rolls.

Boric Acid

This is a colorless substance 4.8 per cent soluble in water at 68° F. It is non-poisonous and safe to use, although more expensive than borax. It gives a slight pinkish-brown color to groundwood.

Pulp was treated as follows:

5 Per Cent Solution (Warm)
30 small laps groundwood.
20 small laps sulphide.

The pulp contained from 0.7 to 1.2 pounds dry chemical per 100 pounds wet pulp.

Results—The pulp was somewhat molded after six months, but in fairly good condition. After twelve to thirteen months it was still in fair condition with no active decay present.

Sodium Fluoride

This is a white salt 4.3 per cent soluble in water at 64° F. It is perfectly safe for workmen to handle and produces no chemical discoloration in the pulp.

Pulp was treated as follows:

1 Per Cent Solution
75 lbs. commercial groundwood laps at mill.
2 Per Cent Solution
100 lbs. commercial groundwood at mill.
3 Per Cent Solution
30 small laps groundwood.
20 small laps sulphite.
112 lbs. commercial groundwood at mill.
5 Per Cent Solution (Warm)
24 small laps groundwood.
20 small laps sulphite.

The small laps treated with 3 per cent solution contained approximately 0.6 lb. of chemical per 100 pounds wet pulp; the 5 per cent treatments contained about 0.9 lb.

Results—The 3 per cent solution preserved the pulp very well, permitting only slight molding after one year. Part of the pulp at the mill was somewhat molded after six months, but not seriously.

The 5 per cent solution held is nearly clean for twelve months except in one case, in which the pulp was badly molded and somewhat decayed.

The 1 and 2 per cent solutions at the mill gave somewhat variable results, the pulp in some cases being only slightly blue-black molded, and in other cases rather badly so. It was, however, free from decay.

Sodium Dinitrophenolate

This is a yellow salt producing a yellow solution. It is approximately 2.4 per cent soluble in water at 59° F. While in concentrated form it is considered an industrial poison. It is not thought that it will injure the health of workmen in the dilution recommended, provided reasonable care be exercised. It colors the pulp slightly yellow in the lower, and distinctly yellow in the higher concentrations. This color readily washes out, but the washed pulp may be somewhat darker than normal.

Pulp was treated as follows:

1/16 Per Cent to 1/15 Per Cent Solution
10 small laps groundwood.
20 small laps sulphite.
75 lbs. commercial groundwood at mill.
1/10 Per Cent Solution
94 lbs. commercial groundwood at mill.
¼ Per Cent Solution
10 small laps groundwood.
20 small laps sulphite.
100 lbs. commercial groundwood at mill (2/15%).
¼ Per cent Solution
10 small laps groundwood.
20 small laps sulphite.
½ Per Cent Solution
10 small laps groundwood.
20 small laps sulphite.
1 Per Cent Solution
10 small laps groundwood.
10 small laps sulphite.

The pulp contained approximately the following amounts of dry salt per 100 lbs. wet pulp:

1/16% concentration ..... .015 lb.

⅛% concentration ..... .25 lb.
¼% concentration ..... .06 lb.
½% concentration ..... .08-0.1 lb.
1% concentration.....0.14 to 0.2 lb.

Results—One-sixteenth per cent concentration partially protected for twelve to thirteen months.

One-fifteenth per cent concentration at the mill permitted a small amount of blue-black mold in six months.

One-tenth per cent at the mill permitted a little mold and decay in six months.

One-eighth per cent kept the pulp in clean or nearly clean condition for twelve to thirteen months.

Two-fifteenths per cent at the mill held it in fairly good condition for six months.

One-fourth per cent preserved completely for six months. In one case there was considerable decay in thirteen months in the groundwood, although the sulphite remained clean. At this concentration the pulp is discolored a rather deep yellow.

One-half per cent preserved well for six months, but permitted a little molding and decay in twelve to thirteen months.

One per cent almost completely preserved for thirteen months.

Sodium Dichromate

This is a reddish brown substance readily soluble in cold water and yielding an orange-yellow solution. It immediately stains the pulp slightly yellow but on standing this becomes brownish, darkening the pulp somewhat when applied in a 2 per cent concentration. It is classed as a poison but is not considered dangerous to handle.

Pulp was treated as follows:

½ Per Cent Solution
20 small laps groundwood.
1 Per Cent Solution
20 small laps groundwood.
20 small laps sulphite.
100 lbs. commercial groundwood at mill.
2 Per Cent Solution
20 small laps groundwood.
20 small laps sulphite.
100 lbs. commercial groundwood at mill.

Pulp treated with ½ per cent solution contained about 0.1 lb. dry salt per 100 lbs. wet pulp; that treated with 1 per cent solution 0.2 to 0.24 lbs.; with 2 per cent solution about 0.4 lb.

Results—One-half per cent solution preserved the pulp for about three months but failed in six months.

The one per cent solution kept it in rather good condition for six months but failed in thirteen months, except in the case of sulphite pulp. The slight darkening effect is not objectionable.

The six months test using a 1 per cent solution at the mill was very favorable, with only slight molding.

The 2 per cent solution kept the pulp clean or nearly so for five to six months, but largely failed from mold and decay after twelve to fifteen months, although the sulphite held up better than groundwood. The six months' mill test was very favorable.

Sodium Bicarbonate

This is a white salt readily soluble in cold water. It is a fairly strong alkali, consequently browning the pulp to a marked degree. This color readily bleaches out, however, in the case of sulphite pulp, without increased bleach consumption, but the pulp is somewhat softened from the action of the alkali.

Pulp was treated as follows:

5 Per Cent Solution
14 small laps groundwood.
20 small laps sulphite.
7 Per Cent Solution
10 small laps groundwood.
10 Per Cent Solution
20 small laps groundwood.
20 small laps sulphite.

The sulphite pulp treated with 5 per cent solution contained 1.2 lbs. of chemical per 100 lbs. wet pulp. No data are available on groundwood.

Groundwood treated with 7 per cent solution contained 1.5 lbs. of chemical.

Pulp treated with 10 per cent solution contained 2 lbs. of chemical.

Results—In general, the 5 per cent solution kept the pulp in clean or nearly clean condition for a year, but in the two earlier series it became badly molded and rotted after twenty-one months.

The 7 per cent solution held the pulp nearly clean for thirteen months.

The results on the 10 per cent solution were likewise favorable. After twelve to fifteen months the pulp varied from clean to somewhat molded, with traces of decay in some cases.

Sodium Carbonate

This is the ordinary white baking soda. It is soluble up to about 8½ per cent in cold water. It browns the pulp the same as sodium carbonate and also apparently softens it.

Pulp was treated as follows:

5 Per Cent Solution
34 small laps groundwood.
20 small laps sulphite.
10 Per Cent Solution
24 small laps groundwood.
20 small laps sulphite.

Pulp treated with 5 per cent solution contained 1.1 to 1.2 pounds of chemical per 100 pounds wet pulp. That treated with 10 per cent solution contained 1.9 to 2.3 lbs.

Results—In general, the 5 per cent solution was about as effective as 5 per cent sodium carbonate.

Pulp treated with 10 per cent solution was clean or only slightly attacked by fungi after one year. The first series was in bad condition, however, after twenty-one months.

In considering the pulp preservation question it may be well to mention that neither fresh nor waste sulphite liquor have proved satisfactory, nor has bleach liquor, under the severe conditions imposed in the laboratory tests.

A few other substances not yet manufactured on a commercial scale, but tested only under mill con-

ditions over a six months' period, have proven highly efficient and should be given more rigid investigation provided they could be prepared in commercial quantities.

General Discussion of Preservatives

In selecting a suitable preservative several things besides effectiveness as an antiseptic must be given consideration, such as:

1. Poisonous properties.
2. Objectionable chemical discolorations.
3. Objectionable odors affecting the workmen.
4. Solubility in cold water.
5. Cheapness.

Some substances which are quite efficient as antiseptics must necessarily be ruled out of commercial use because, in handling either the solutions or sprayed pulp, sufficient quantities of the poison may be absorbed through the skin to impair the health of the workmen. Likewise, violent poisons which might accidentally enter the body through the mouth must be avoided in order to protect the consumer. Examples of such dangerous substances are mercuric chloride (corrosive sublimate), sodium arsenate, sodium cyanide, etc.

Some highly efficient antiseptics produce objectionable discolorations in the treated pulp, due either to the color of the chemical or its caustic or other action on the wood fibre. All of the alkalis produce browning, the depth of which depends on the substance used and the concentration of the solution employed. For instance, borax produces a slight browning but not sufficient to be objectionable, while both sodium carbonate and sodium bicarbonate will distinctly darken the pulp; too much for successful use commercially.

Sodium dichromate likewise ultimately browns the pulp considerably when applied as a 2 per cent solution and above, and some mills might object to it on this score. In the single mill test made, however, the superintendent thought it would be satisfactory.

Sodium dinitrophenolate is apparently not adapted to commercial use on groundwood in concentrations above ⅛ percent. Even at ⅛ per cent the yellow tinting is distinctly noticeable, but it readily leaves the pulp on washing.

None of the substances mentioned have objectionable odors, but some of the chemicals experimented with are open to this objection.

Solubility in cold water is a very important factor, as, in most cases, the chemicals are most easily applied in the form of water solutions. The solutions should be applied on the press roll. The concentration employed should be sufficiently high to reduce the amount of water applied to a point where it will not interfere with the removal of the laps from wood rolls. In the case of such stubstances as borax or boric acid, where the solubility in cool water is limited to 5½ to 6 per cent, careful adjustment of the rate of flow will be necessary in order to apply the required amount of dry chemical and at the same time reduce the amount of water to a minimum.

With a brass roll there is little danger of the pulp sticking to the roll.

When the solution is applied back of the press roll the loss in antiseptic is too great, it being squeezed out with the excess water at the roll. Tentative tests made on the experimental wet machine at the Forest Products Laberatory indicate that only about 40 per cent of the chemical applied is thus retained by the pulp. This difficulty can be partly overcome by applying a more concentrated solution to the pulp at the press roll. When so applied the retention is about 70 per cent, with a 5 per cent solution and 74 per cent with a 2 per cent solution.

In applying preservative solutions this loss of 25 to 30 per cent must be compensated for in order to secure the actual concentration of the chemical in the pulp which is necessary for preservation.

In interpreting the results presented in this paper it should be kept in mind that the preservative applied in the laboratory tests was all retained, while in the mill tests in all probability 50 per cent or more was lost in the white water.

Outside of technical difficulties in application the deciding factor in the use of any chemical from a commercial standpoint is the cost and the laboratory workers have had this constantly in mind.

Assuming that the pulp normally leaves the wet machine one-third dry, in order to secure the retention indicated in the laboratory tests outlined above (after compensating for the loss of chemical in the white water) the amount of dry chemical applied at the press roll per ton of air dry pulp would be as follows:

Strength of Solution	
5%	80 lbs. per ton
3%	48 lbs. per ton
2%	32 lbs. per ton
1%	16 lbs. per ton
⅛%	2 lbs. per ton

The market quotations on the chemicals which seem best adapted for commercial use, as taken from the June 6 issue of the Oil, Paint and Drug Reporter and verified by quotations by telegraph from manufacturers, would place the chemical cost of treatment per ton of air dry pulp as follows:

Borax at 5½c in 3% solution	$4.40
Boric acid at 13¼c in 5% solution	10.60
Sodium fluoride at 12c in 3% solution	5.76
Sodium dinitrophenolate at 75c in ⅛% solution	1.50
Sodium dichromate at 8½c in 1% solution	1.36

A number of mills manufacturing pulp were recently circularized by the Laboratory in order to gain some idea as to the additional expense they would consider commercially feasible in safeguarding their pulp which is to be stored for any considerable time. Replies were received from twenty-three. The estimates of the nine companies submitting definite figures varied from $1.25 to $5-$6 per ton, under present commercial prices, the average for maximum figures being about $3.50. On this basis only two

of the preservatives suggested would be available, unless mill tests should further demonstrate that lower concentrations could be used, and this is altogether a possibility under improved methods of applying the preservatives so that a greater amount will be retained by the pulp. Likewise greater attention to improving sanitary conditions in storage will assist in keeping down fungus infections, such as, for instance, the use of clean concrete bases upon which to pile, the removal of all rotting debris from the vicinity of piles and close attention to see that no infecting material, such as bits of infected wood, planks or sticks which have been in contact with the soil be introduced into the piles. This latter is highly important, as the least bit of infected wood or other debris mixed in with the laps will serve as a center of infection which may eventually destroy large sections of a pile.

Conclusions

Judging from the antiseptic efficiency and freedom from other objectionable features sodium fluoride appears to have given the best results of those preservatives reported upon.

Borax follows a close second.

Boric (boracic) acid is equal or somewhat superior to borax but the greater cost throws it out of competition.

Sodium dinitrophenolate in ⅛ per cent concentration appears very promising, with an antiseptic efficiency equal to anything tried, but the yellowish chemical discoloration of the pulp may prove objectionable for some purposes. This readily washes out, however, although it may leave the pulp somewhat browner than normal.

Sodium dichromate appears to be less favorable than the four above mentioned substances as the antiseptic efficiency varied rather too widely in the tests and the tendency toward browning, and possible softening, of the pulp is rather marked, particularly in concentrations of 2 per cent and above.

Sodium carbonate and bicarbonate, while quite efficient in 5 per cent solutions, brown and soften the pulp too seriously for commercial use.

Recommendations for Further Work

Actual mill tests on not less than 500 lbs. of wet pulp should be made on each of the above preservatives, applying them at the press roll and wherever possible in higher concentrations than formerly so as to reduce losses in the white water. In addition to these there are a few other substances which appear promising but which have not yet been sufficiently tested to report upon.

This work is entirely dependent upon mill cooperation and must necessarily be financed by them, as the fund previously set aside for the pulp deterioration study is now exhausted.

Pulp and Paper Screens

By PHILLIPS DENNETT
Bird Machine Company

Presented at the Convention of the American Pulp and Paper Mill Superintendents' Association on June 3, 1921, at the Waldorf-Astoria Hotel, New York

PLEASE take this paper as nothing more than a collection of notes on pulp and paper screens. They are made up partly from the experiences of the company with which I am connected. We have been at the screen business for nearly twenty years, and I think we can say modestly that we have learned some things—some, I can assure you, by traveling a hard, rough road. I have also had the benefit of extremely useful data which a number of our paper mill friends have been good enough to give me out of their experience. In no sense is this intended to be a scientific paper. Perhaps it is unnecessary to say so, but I want to avoid any possible misunderstanding. One paper maker warned me by saying in about these words: "The subject of screens is rather a difficult one to write on; practically everyone connected with the business has a different idea." I suppose this is pretty much so, and I am a little concerned about it, but I am going ahead with my own views, confident that you will receive them in the spirit with which they are offered, and that where we may not agree you will, through discussion, give to me and to your membership the benefits of your own experience and beliefs.

The background of history may help to give a better perspective on the present. A hundred years ago there were no screens. An effort was made to keep the paper free from the mechanical impurities we now call dirt by careful preparation of the rags from which all paper was made. The lumps and knots were removed from the paper, not before, but after it was made. The sheets were gone over by hand and the knots removed by picking them out with a penknife. The first screen of which I find any record is one invented by Richard Ibotson of England about 1830. This was a screen in which the box containing the plates was vibrated. It was the forerunner of the knocker type of flat screen, which was almost exclusively used in this country up to about 1890 to 1895. The diaphragm screen soon followed, but it was not perfected and had no great sale while the knocker screen flourished. When it did find itself and get under way, it quickly replaced the knocker screen. For one thing, it was very much cheaper, both to manufacture and to use; for another thing, it was about that time that wood pulp came into widespread use and the conditions of screening were easier. With all its noise and expense, the knocker screen had a

Under this one roof—a score of miniature dye plants are producing American Dyes.

Heliopont Colors

FAST TO LIGHT

This series of Du Pont Colors is of particular interest to the paper trade because of its brightness of shade and fastness to light.

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DU PONT DYESTUFFS

highly developed ability for putting long rag stock through fine cut plates, and many a superintendent whose paper-making memory is long enough has now and then a wish that he had his Gould screen back.

Rotary screens date back to about 1860, when Christian Wandel, a German, invented the original Wandel screen an outward flow type. About the same time there were invented inward flow rotary screens, of which George Bertram, of Edinburgh, brought out one of the earliest, if not the first. To me the important thing about this is not accuracy concerning the date or the original inventor, but the fact that rotary screens of both types have been known so long and yet until so recently left undeveloped. They did soon become the screen commonly used in European countries, but they were never used in the United States until well into the present century. One or two of the German or British screens had been imported before that time, but these were not successful, mostly because the European design was unsuitable for the much harder mechanical conditions imposed by American mills. The same reason held back for a long time the development of rotary screens, after they were first manufactured in this country about twenty years ago. The mistake was made of depending too much on the success of the various screens in the mills abroad, and the error persisted for years before it became apparent that in order to ultilize the full value of the rotary principle, it would be necessary to devise a form of construction suitable to the particular demands of American mills. It is only in the last ten years that great progress has been made.

Following the development of wood fibre and the establishment of pulp mills as the chief source of supply for paper making fibres, wholly new demands were made on screening apparatus. This does not seem to have been quickly realized, and for what seems like a long time the pulp mills used exactly the same kind of screens as were used in paper mills, first knocker screens and later flat diaphragm screens. It was really the beginning of the present century before screens were developed for the particular needs encountered in the screening of pulp, and it is only in the past ten years that pulp screens have been a great success.

Big Development in Last Ten Years

Perhaps it is partly because my own experience covers this particular period, but, whatever the reasons, I am of the opinion that more has been done to develop the screening of both pulp and paper in the last ten years than ever before. This may be a very natural result of the fact that during this time certain machine builders have made a business of screens, usually specializing on the screens for one of the several distinct fields. It is perhaps worth mentioning as a point of difference between earlier screening methods and those of the present day that, up to twenty years ago, one type was generally used for all kinds of stock and conditions of screening. Today there is a type of screen which is purposely built for each type of work.

In discussing present types of screens it is perhaps convenient to classify them into two broad groups—pulp screens and paper screens. In some cases the same screens may be used for both kinds of work, but this is not general, nor, by and large, productive of the best results. It may also be well to consider briefly the difference in the requirements which have to be met. Purely as a mechanical matter, screening pulp is very different from screening the stuff for a paper machine. To begin with, the physical characteristics of the fibre in the pulp mill are in most cases different from the fibres found in paper mills, with one large exception—newsprint mills, where the stock is handled continuously in slush form. Without exception, there is another great difference—the amount of tailings which have to be removed. The stock which is delivered to the screens in the pulp mill carries from 6 to 10 per cent of tailings, while in the case of paper machine stuff the amount of material to be rejected is a small fraction of one per cent. This is an extremely hard condition which the pulp screen has to meet. On the other hand, the pulp screen has an advantage in this respect, that the stock can be diluted to any consistency desired. The paper screen is often handicapped by lack of water, the limit of dilution being that which can be taken care of on the paper making wire. The screen is thus governed by the paper machine and cannot be handled as might be best if it were working independently, as the pulp screen does.

The primary function of the paper screen is quite apart from the removal of a large quantity of tailings, as in the case of the pulp screen. Going back into history, we find the early screens called "pulp dressers," "knot catchers," or "knotters." Their object was to supply the paper machine with fibres well separated from each other as well as from the knots or bundles of fibres that were not reduced in the beating process or had gathered themselves together while on their way to the paper machine. A paper screen is a comb, as well as a knot catcher. It is also true that the paper screen should remove mechanical impurities of one kind or another, generally called dirt, which have in some way got into the stock, but this is almost incidental. The major duty of the paper screen is to put onto the paper machine wire a supply of stock which will be a homogeneous mixture of water and thoroughly separated fibres free from knots or slugs or slime.

Two Chief Types of Pulp Screens

Considering pulp screens, there are two types chiefly used, centrifugal screens and inclined diaphragm screens. A third type, the inward flow rotary screen, has been used to some extent, mostly in Europe, but it has not gained any large success. It

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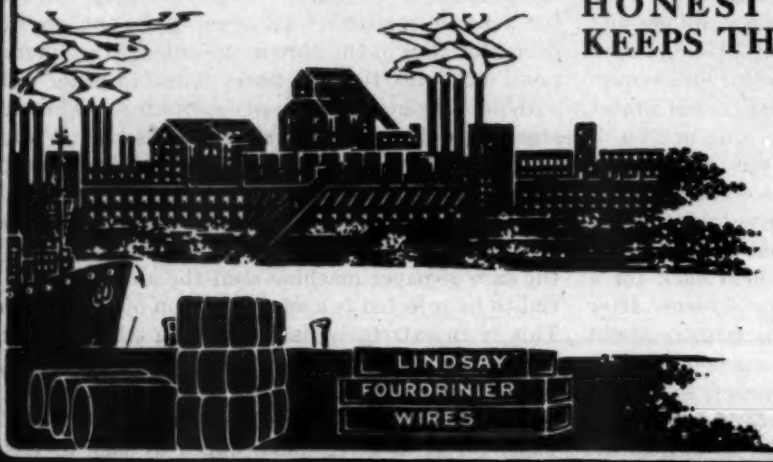

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will be considered later as a paper screen, where it is perhaps the outstanding type. By far the largest tonnage of pulp made is screened through centrifugal screens. This includes newsprint sulphite, other No. 2 sulphites, sulphate and soda pulp, mostly the pulps which are made to be used by an adjoining paper mill, and not to be sold. This type of screen is very interesting as a foundation for future development. It is compact, of great capacity, and very well perfected, from the mechanical viewpoint. The chief disadvantages for the engineering of the future to overcome are these: 1, inability to screen pulp clean enough for No. 1 quality, and 2, heavy power consumption. Developments of the past ten years, however, offer good grounds for hope that much may be expected in the ten years next to come. The other largely used type of pulp screen is the inclined diaphragm screen, which I think holds its place largely because of one very valuable feature—its ability to produce No. 1 pulp of the cleanest kind. It is used by most mills making high-grade pulp or almost any kind of pulp for sale in the market. Most of the foreign pulp which is imported for our paper mills is made through this type of screens. The diaphragm screen as made today is vastly improved over similar screens of a few years ago, but it does not seem to offer the same hope for the future as does the centrifugal screen. The power requirements are about the same; the cost of operation, including attendance and repairs, is very much higher. In the words of one very capable critic, the diaphragm screen compares unfavorably with other types because it involves a large amount of moving parts per ton of product screened, and consequently a high cost of repairs.

Three Classes of Paper Screens

The paper screens in use today group themselves into three broad classes—flat diaphragm screens, outward flow rotary screens, and inward flow rotary screens. The first was almost exclusively used in this country following the exit of the knocker screen, and until about fifteen years ago. It is still the most common in use, but the other types, especially as developed in the last five years, have made great strides. Flat diaphragm screens can be used and are used on almost every grade of stock, although the operating difficulties increase as the fibre is longer and wetter working. They hold their place, I think, largely because first they are cheap, because on a great many stocks they permit the use of extremely fine plates, and because in a place where it is necessary the plates can be quickly changed. The disadvantages, however, are really great. The screen plates fill up and get foul on the bottom side, causing lack of uniformity in the flow of stock, and, what is more serious, pass slugs and slime to the paper machine, which cause breaks and necessitate shut-downs for washing up. Often the use of flat screens entails the employment of labor to rake the top of the plates. This is not only a great expense, but it is a job in the mill which ordinarily is hard to fill. Mechanically, the flat screen is open to the same objections as is the inclined diaphragm screen referred to under pulp screens, and the operating cost is high. In general, flat screens do not seem to be the paper screen of the future.

The outward flow rotary screen, for years as common in Europe as the flat screen here, and the first rotary screen to be manufactured in this country, was at first applied on various grades of stock, but has now found its proper place as the screen for long, wet working fibers, such as that obtained from rags or manila rope. It is particularly valuable on ledger and bond paper, rope manilas, rags or jute tissues, as well as on any lightweight papers which are made in small capacities. It will work on any grade of stock, but it does not make an economical installation on the majority of grades, because its capacity is low. In action it is nearer to the knocker screen than any other type, which I think is one reason why it works so well on long stock. Mechanically, it has been well developed, and it is now a very cheap screen to run. It is, I think, a very logical type of screen in its particular field, and I judge its popularity will continue to increase.

The third general type of paper screen, the inward type of rotary screen, has come into its own in the last five years, and is perhaps the real sensation in paper screens. As an evidence of its popularity already about 8,000 tons of the paper which is made each day in the United States and Canada are made through the screens of this type which are built by the company with which I am connected. The inward flow type of screen can be used on almost every grade of paper, and to some extent it is used on rag stock and long, wet working stock, but in general not. It operates best on the kinds of stock which have shorter fibers and carry plenty of water, such as papers made from pulp and paper stock, which means, of course, the bulk of the paper made. Some paper makers seem surprised that this type of screen works well and pays its way in board mills and mills making similar coarse papers. In fact it does, and as great economies and improvements have been effected in board mills as in any other class. At this time I venture to express my opinion that the early future will see great changes in board mill screening. The capacity of the inward flow rotary screen makes it especially valuable on the new and large board machines which are making or will make twenty-five tons or more per day per mould. In the case of smaller machines, this capacity can be utilized by supplying two or three moulds from one screen, and although this is heresy to one school of paper makers, there are many others who like it and know it will work, especially when rotary screens are used.

Reverting to the general case, the inward flow rotary screen has, from an operating viewpoint, over-

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come the great majority of troubles which a few years ago seemed to be inherent in screens. Like all rotary types it provides for automatic cleaning of the screen plates, troubles due to strings, lumps and slime are almost unknown, there are very few breaks that are caused by the screens, and under most conditions the screens never cause a shutdown for washing up. Uniformly good paper can be made continuously from day to day. In many mills the screens are washed only on Sunday. From a mechanical viewpoint the inward flow rotary screen has been well developed; it gives little trouble and the operating cost is low from every viewpoint—power, plates, attendance and repairs. The chief advantage or hindrance to sale at the present time seems to be the high cost, as compared to flat diaphragm screens, but this, after all, means nothing more than charges for interest, taxes and depreciation, which are not serious factors in manufacturing cost. At present it looks like the leading type of paper screen, and I think that we shall hear much of it in the future.

I can think of nothing better to leave in your mind than the parting shot of that famous paper maker, Karl Hoffmann, in the article on screens in his original "Treatise on the Manufacture of Paper," published in 1873. What he says has been good for forty-eight years, and I think it will be good for many times forty-eight more. I quote: "The frequent examination of the screening is to the foreman a guide for the improvement of all preceding operations. If too much rubber, sealing-wax and similar substances are found, it is an evidence that the rags or waste papers have not been sorted as carefully as they should have been. If lumps of fibers, rags or paper are found, the engineer is to blame for not stirring the pulp often enough, or for allowing it to leave the beater without having been thoroughly brushed." Hoffmann's comment needs a little adaptation for pulp and paper mills of our day, but I think he would say to you in these times that for many of your screen troubles you should look to your raw stock, your beater room, your rag room, or, in the case of the pulp mill, your wood room. Your screens are of great importance; they have an enormous effect on the outcome of your work, not only in respect to quality, but also with direct bearing on the quantity of production; yet, by and large, the quality of your paper must be determined elsewhere.

Industrial Relations

By GEORGE P. HAMBRECHT

Chairman, Industrial Commission of Wisconsin

The following paper contains suggestions for a constructive program, and was delivered recently before the Wisconsin Manufacturers' Association. Though directed particularly to that state, the ideas expressed therein are adaptable everywhere.—Editor.

MANAGEMENT cannot shut its eyes to the organized struggle of labor for better and more stable industrial conditions, nor should labor ignore the problem of management in directing industrial production. The problems arising out of our complex industrial situation will not be intelligently solved by either group working alone, presenting, as each group has in the past, extreme ultimatums to the other group, threatening paralysis to the entire industrial structure until the ultimatum is met. Surely a better plan can be devised for the satisfaction of each group and for the benefit of the public.

It occurs to me that a voluntary industrial conference committee made up of equal numbers of employers and employes, with such public representatives as they may agree upon, will go a long way toward settling some of the many difficult questions arising out of the industrial problems of reconstruction following the close of the world war. Reorganization and reconstruction of industrial conditions now in progress are causing considerable embarrassment to management and genuine hardship to labor. The Industrial Commission of Wisconsin is assisting in every way it can to help in the solution of the question of unemployment, and it is being aided by cooperative committees made up of representatives of employers' organizations and of labor organizations respectively, all working through the several public employment bureaus throughout the state—11 in number. When the condition was reversed during the war period and labor was scarce, the commission was further aided by a State Advisory Board on Employment, made up of equal numbers representing both management and labor.

The cost of living to labor, threatened with the problem of unemployment and reduced wage scales, the fluctuating cost of materials to manufacturers and the uncertain marketing conditions now prevailing, render the present industrial situation a hardship to labor, and a serious business problem for management. Both employers and employes are now confronted, and have been for some time past, with serious industrial problems vitally affecting the present and future policies of correct industrial relations. Employers throughout the country have local boards working on the problem, endeavoring to revive and maintain industrial activity. Labor organizations have similar committees working to improve labor conditions, having in mind the permanent and

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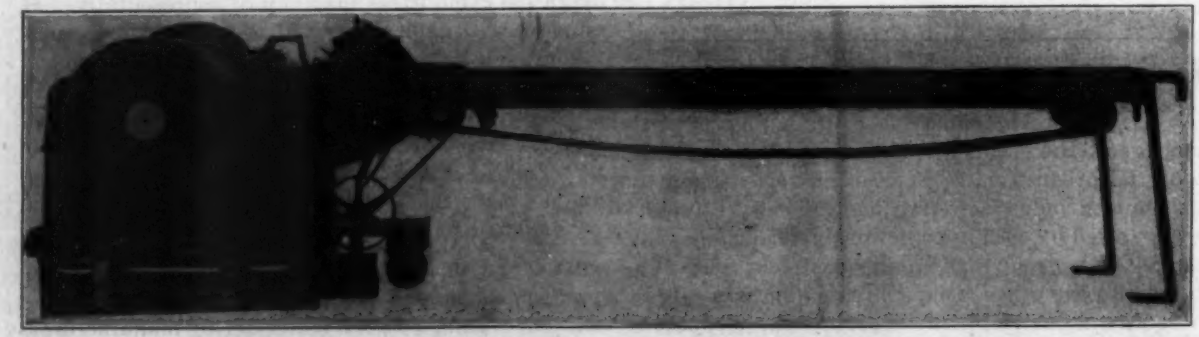

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best interests of the workers during and following the period of industrial stress. Each of these boards and committees is working, in the main, independent of each other, neither emphasizing the problem of the other, but each chiefly concerned with its own peculiar situation and surrounding difficulties. Often each group blames the other for conditions which both might remedy by a better understanding of each other. As this condition progresses, many misunderstandings between the respective groups develop and a considerable number of cases of strained relations, unjust suspicions and bitterness creeps in.

All Want Final Policies Adopted in Reorganization of Industry

Employers, employes and the public are all vitally interested in final policies to be adopted in the reorganization of industry, and each should take the other into consideration through conference on the many industrial questions involved, in order to avoid further misunderstandings and bitterness. And it occurs to me that a voluntary committee, representing both employers and employes, equal in number, should be created in order to frankly and freely discuss the many problems arising out of our complex industrial situation, each representative element of the committee having due regard for the rights and responsibilities of the other, and each presenting to the other its many problems with reference to industrial and living conditions. This committee, of perhaps six in number, should be chosen three by the employers of labor through their recognized state association and three by the Central Trades Labor Council, so as to make the committee thoroughly representative—the six so chosen to add such public representatives as may be agreed upon.

The Industrial Commission would cooperate with such a committee in every way possible to bring about a workable industrial program for Wisconsin, with a mutual understanding between the parties to industry and, as I believe, with permanent benefit to both. Personally, I feel that a conference committee of this kind would result ultimately in industrial harmony, and through industrial harmony alone can a community, a state, or a nation permanently progress.

The commission will do everything in its power to assist in carrying out the true purposes of such an industrial conference committee once organized. Much of the work of the Industrial Commission is now carried on in many of its departments assisted by joint committees of employers and employes as herein outlined. In fact, Section 2394-52(8) of the statutes provides, among other things, that the Industrial Commission may organize such a committee on its own motion in case of labor disputes, lock-outs, strikes, and serious labor trouble. The conference committee as suggested here, however, is to avoid industrial trouble rather than attempt to remedy conditions after such trouble starts through misunderstandings or bitterness. This industrial conference committee,, if organized, could be of great assistance to legislative committees working on industrial problems, and any affirmative program recommended by such conference committee would be welcomed and given great weight by the legislature. It would result in a constructive, intelligent movement for good industrial and labor legislation.

I suggested the plan above outlined to groups of employers and labor officials shortly after the signing of the armistice in 1918, but at that time it was generally thought by the employers that industrial conditions would result in a more complete understanding of the problems common to both labor and capital and the suggestions then made were not given serious consideration. Experience has shown, however, the error in this conclusion.

Representative Committee

It is true that many attempts have been made, both nationally and locally, subsequent to the signing of the armistice, to secure industrial conference committees, but the personnel of most of these conferences was "selected" by some public official, or official body, and was not "representative" in the same sense that chosen delegates would be. The industrial conference committee suggested in this address should be representative in every sense of the word, and to the conference, with the idea of working out a constructive industrial program, and I do not think such conference would waste its time quarreling about non-essentials. In fact my experience in this field of work has led me to conclude that there are more points of contact, affecting a community of interest between management and labor, than there are points of difference. Even the points of difference can better be harmonized in the manner here suggested than by the present method of enlarging each grievance before willing ears, arousing the baser passions and prejudices of one group against the other. Neither group has any monoply on truth, nor does either group hold within its own membership the complete knowledge necessary for a final and equitable solution of the industrial problems, but each group has constructive ideas worthy of serious consideration by the other.

I firmly believe that the industrial situation throughout the country would be in better shape today if labor, management and the public had grappled with the situation as outlined in this recommendation before bitterness and misunderstandings had crept in. What we need today is a constructive program for greater intelligent production, having due regard for greater conservation of human energy spread over a lifetime, all based on a program of fair play to labor, capital and the public. This can only be worked out effectually through mutual conference of the best minds in the three groups. Each group must

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thoroughly understand and appreciate the viewpoint of the other. First having due regard for the health, welfare and comfort of the individual worker, conserving human energy in the most efficient manner, then each group should encourage maximum efficiency so as to maintain a high standard of intelligent production. The wage question, which includes the equitable distribution of the net proceeds from production, is important and I believe can be adjusted through mutual conferences involving all of the elements above outlined. If each party to such conference is firmly imbued with the idea of fair play and honesty of purpose, I feel confident of right results.

Another difficulty I see with the many recent conferences heretofore had, which appear to follow the line of thought in this address, and where failure has resulted, is that these industrial conferences were called after strikes were threatened and after bitterness had developed, often after an actual strike had been called, and a walk-out of workers resulted. The parties to the conference then entered into consultation either in a fighting and antagonistic mood, or else in the attitude of a shrewd bargainer, tinctured with malice, to get the best of each other, if possible.

The industrial conference here suggested should be brought about before industrial trouble starts, rather than after—a voluntary conference, rather than a forced one, in order to work out a just and equitable program for sound industrial relations. In all this kind of work, however, we find that human selfishness is an obstacle to a more correct understanding of each other's viewpoint. If the parties to this conference entered it with an honesty of purpose, to better industrial conditions, and to make the Golden Rule our guide in fact as we all hold it to be in precept, then success and better industrial conditions for all would surely result.

Why the Slanderer?

What a delightful reputation to have—one who has always something good to say of everybody. And what more unlovable person can there be than the one who has always a catalog of faults or scandals to recite against everybody? And this leads to the queries, why the slanderer? What is his or her purpose? What do they wish to accomplish? They perhaps do not seek to destroy the slandered ones, nor themselves; but they are really doing a great deal in that direction. Certainly the quickest way to become unpopular is to have a magnifying glass and a megaphone for the ills and faults of our friends, and to be deaf, dumb and blind to their virtues.

The waste basket gets too prominent a place in every business establishment. The great need is for less and still less waste, materially, morally, physically and financially.—R. L. S.

Electric Truck Makes Big Saving

JAPAN, realizing her basic problem to be that of feeding her population of 60,000,000,000 has consistently encouraged industry to provide work that each might maintain himself. With the building up of her industries, naturally a pace has been set in each which must be kept uniform in each department.

The war having raised somewhat the plane of living, the wage has increased. In order that she might

compete in some industries, it has been realized that equipment to speed production and reduce costs is imperative.

In the paper mill just outside Tokyo it was customary to employ a great number of truckers and carriers, each receiving an equivalent of $1.50 per day. These men could handle, at most, two of the bales of sulphite from storage to machines at one time.

A prominent electric company in Cleveland offered an electric battery truck for this work. It was tried and proved of wonderful service. Today this ninety-pound man shown above transports twelve bales, or six times what he once was able to truck, at three times his walking speed—a combined saving of 18 to 1 in time, and a total saving in cost of 6 to 1, including every expense in connection with the operation of the unit.

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A METHOD used by the Forest Products Laboratory for determing the amount of moisture in chips and sample borings from large pieces of wood requires little equipment and only a few minutes' time. The moisture content of pulpwood chips can be found by this method in from 7 to 10 minutes.

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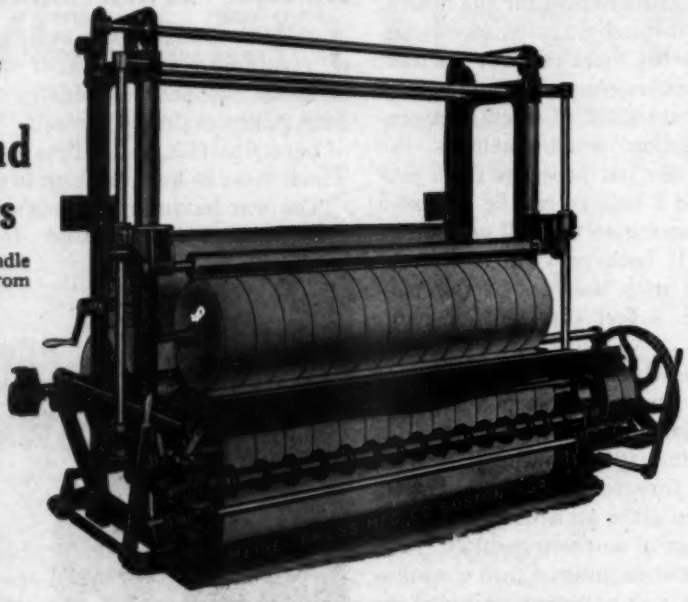

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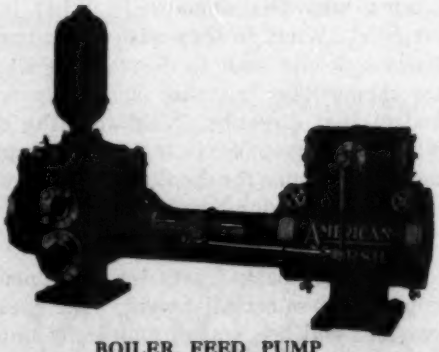

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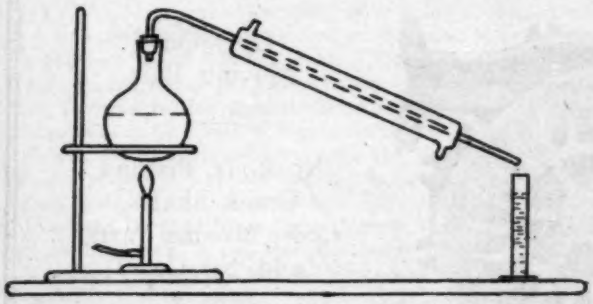
changes to steam at 212 degrees and goes out through a glass tube in the cork of the flask, is condensed by a water jacket surrounding the tube and caught in a measuring glass. The boiling point of kerosene being higher than that of water, all the moisture will be driven off the chips before the oil vaporizes to any great extent. The oil that does go off in the



form of vapor is condensed and caught in the same graduate with the water. When the evaporation of moisture is complete the oil and water are allowed to remain a few minutes until the water has all settled to the bottom of the graduate. The amount of moisture in the wood chips is then found by a direct reading.

This method has been checked for accuracy with the method of weighing samples before and after oven drying, and the variation found to be less than 1 per cent.

It is the big rollers and heavy weight that flattens out the correct sheet. This teaches us that we need not be afraid of the STEAM ROLLER; it will only make us more solid and a firmer surface.—R. L. S.

Sing It Today

By B. Y. Williams

Is there a song—a brave song in your heart—
Song of a soul yet undaunted by fear,
Buffeted sorely, but cowering not,
Yielding no ground tho defeat seemeth near?
Sing it today.
(Some one is fighting with strength nearly gone—
Some one needs courage to still "carry on.")
Sing it today.

Is there a song of high faith in your heart—
Faith that endures thru the gloom of the night;
Faith that sustains when all other things fail,
Whispering ever, "The end will be right"?
Sing it today.
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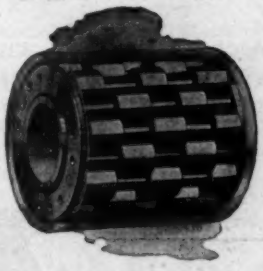

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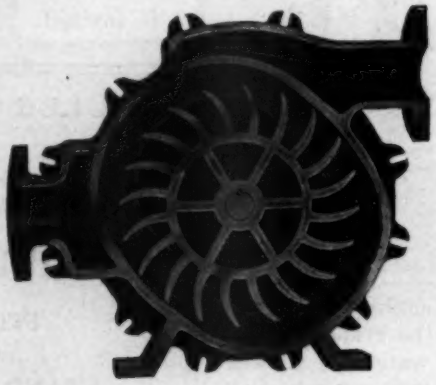

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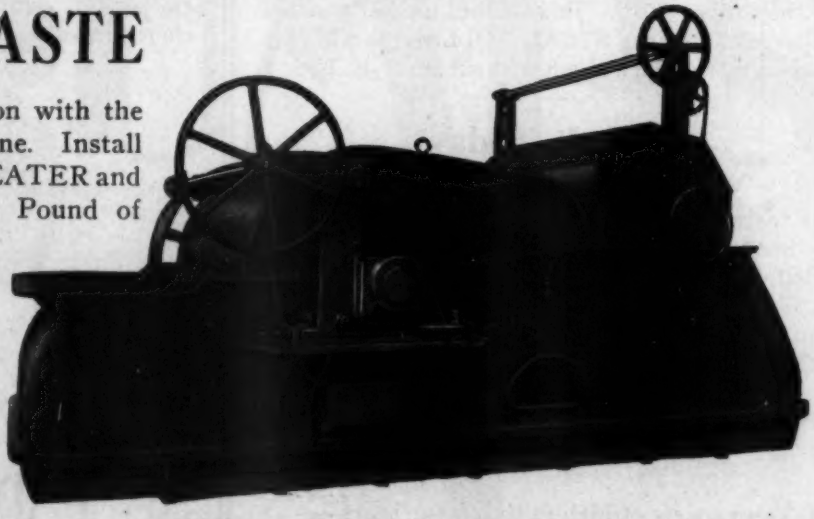

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Summer Meeting of the Technical Section Canadian Pulp and Paper Association

By T. LINSEY CROSSLEY

FEW industrial districts have, in so short a time, shown such tremendous development as the Saint Maurice Valley and Three Rivers, Quebec. Thirty members of the Technical Section of the Canadian Pulp and Paper Association, accompanied by representatives of the T. A. P. P. I. in the persons of Chairman Williamson, Messrs. Kellogg, Campbell and Bolton, with visitors from the United Kingdom—Messrs. Adamson, Kay and Nutall (the last named a member of the Technical Section of the British Papermakers' Association), left C. P. R. Windsor Street Station, Montreal, the evening of June 14th, in two special sleepers for Three Rivers, where they were met by Messrs. Jentz, King and O'Reilly, the local committee in charge.

The morning of June 15th, crystal clear with the freshness of north shore air, and the short walk to the Chateau de Blois, prepared the party for a hearty breakfast, served by chic little French-Canadian waitresses. Thus well fortified, the group proceeded to the Wabasso Cotton Company's fine up-to-date plant, following cotton from bale to bolt with keen interest.

International Paper Company Plant at Three Rivers

The next visit was to the plant of the International Paper Company, nearing completion. This solid and scientifically laid out group of buildings was carefully examined, with a verdict of satisfaction. The large machine room will house four 164-inch machines. One of the most interesting features

TECHNICAL SMILERS

(From left to right) Mr. George Carruthers, Chairman Technical Section; Mr. Percy B. Wilson, President, Canadian Pulp and Paper Association; Mr. A. L. Dawe, Secretary, Technical Section and C. P. & P. A.

of this mill is the battery of eight Babcock and Wilson boilers in pairs, equipped for oil burning, using eighteen hundred gallons of oil each eight-hour shift per unit of four boilers. The sturdiness of the barking and block handling plant were remarked upon, as well as the filter building for sand-air-filtering.

At one o'clock luncheon was tendered by the city officials; Major Clement King of the local committee acted as toastmaster. Mr. King, in welcoming the party, drew attention to the great potential power development in the neighborhood

ARRIVAL AT THREE RIVERS

At the left are Mr. W. Adamson and Harry Kay from Bury, England; in the center are "Jawn" O'Reilly and See-Dee Jentz, with the smiles; Sec. Dawe (hatless) is not selling shoelaces, but distributing T. S. pins.

of Three Rivers, remarking that it even exceeded that of Niagara and at lower rates. Acting Mayor Gouin was then called upon; we were told that he is an enthusiastic pulp and paper booster on the council. Mr. Gouin, with happy manner, welcomed the Technical Section on behalf of the council. Then came Mr. Percy B. Wilson, president of the Canadian Pulp and Paper Association. He had taken note of the great industrial expansion of Three Rivers, and had seen much which indicated wise and public spirited administration. He expressed great appreciation of the work done by the Honorable Jacques Bureau at Ottawa for the city and port of Three Rivers, and complimented the Province of Quebec on its practical and progressive interest in industrial development. Mr. George Carruthers, chairman of the Technical Section, being next called upon, gave a short address in characteristic humor. He was followed by the Honorable Jacques Bureau, member for Three Rivers in the Federal House, who spoke in the delightful vein with graceful manner which is peculiar to French-Canadian speakers. He recalled the earlier village days of Three Rivers contrasted with the present city of thirty thousand; then broadened his address to the whole Saint Maurice Valley, vieing with Niagara for power, and more strategically placed for shipping: Three Rivers being a well-equipped ocean port. He spoke in favor of a governmental policy facilitating individual initiative. After luncheon, automobiles whisked us 'round to see the city and its environments. The writer of this review was acquainted with the Three Rivers of the early nineties, and, to use a French-Canadian metaphor, he certainly "rinsed his eye." In 1895, a dwindling population of ten thousand was supported by two or three lumber mills, a decadent foundry and a well-located coffin factory. Now the population is thirty thousand; there are four pulp and paper mills—including the largest suphate kraft mill in the world—(and even now making very large extensions), the modern cotton mill already referred to; two shipbuilding yards with eight to ten ways (in one of which a

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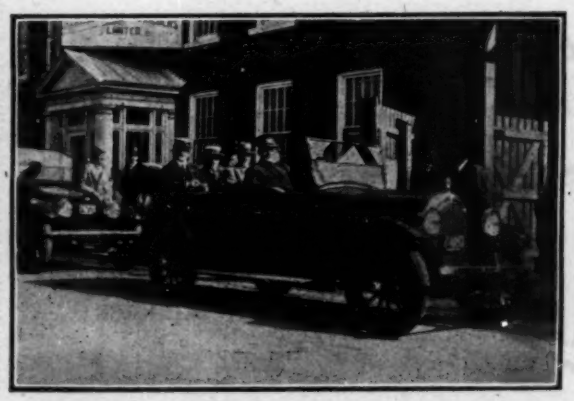
ten thousand ton ship was built for the Government of France and recently launched). Work on three sets of marine engines—two of them the biggest built on this continent—and five enormous Lancashire boilers, was nearly finished in one of the shops, when the Technical Section dropped in and sprawled all around. Then there is an immense pipe foundry, handling all sizes of cast-iron pipe. The papermen saw every last thing, and then as a climax were provided with a "thriller" set by the chief of fire and police, M. Emile Berthiaume, whose powerful red car headed our parade, with some economy in speed fines. Stopping the line in the heart of the city, he invited Mr. Wilson to ring in a fire alarm. In one minute and twenty-five seconds, hose and ladders were on the spot, and five seconds later equipment from the farthest station arrived. Vraiment, this was un occasion, for no one loves the sporting element more fondly than le Canadien Francais.

Visit to Laurentide at Grande Mere

After dinner and a visit by some of the elect to "le Club," we embarked for Grande Mere, arriving there in forty minutes. (Shawinigan, our stop for the third day, was passed en route.) The first view of Grande Mere was in the charm of moonlight on a hill opposite the falls and overlooking the brilliantly lighted mills and the silver and black curve of the river. The members spent the evening informally at Laurentide Inn. The writer lived at Grande Mere in 1891, and consequently felt like Rip Van Winkle. We lived then in one of the eight houses on the top of a bluff overlooking river and twin falls. A head-race was cut from the side of one fall to drive the groundwood mill below. In the middle of that fall was a rock about forty feet high, having—on its upstream side—a curious resemblance to the profile of an old woman; hence the name Grande Mere (Grandmother). Pulp was shipped by aerial tramway across the first fall, the island and second falls to the railway spur three miles from the station at Lac a la Tortue. In those days we left Three Rivers at five in the morning and were lucky if we reached Grande Mere by noon, with a three-mile buckboard drive and the quarter-mile swift-flowing Saint Maurice to cross. Last week's trip of forty



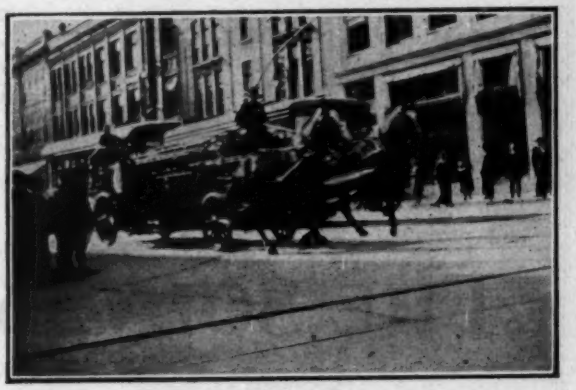
THE BIG RED AUTO

Chief Berthiaume is not taking these "criminals," Geo. Carruthers, Chairman Clem. King of the entertainment committee and "P. B." Wilson to jail, but is personally conducting the Technical Section around Three Rivers and Cap Madeleine.

minutes into the garden city of the Laurentians with its villas, shrubbery and gardens, where we in boyhood struggled through the bush to the old bathing beach now underneath the mill, was a transition which would have inspired the author of the Arabian Nights.

In the morning we breakfasted in the dining-car attached by courtesy of the Canadian Pacific Railway. We had luncheon here, also; the C. P. R. dining service prepared a special menu card with the Dominion coat-of-arms and date of the meeting embossed in dark blue and bound with blue ribbon.

The morning was spent in the mills, parties being arranged on the lines of a questionnaire submitted to the members of the party at luncheon the previous day. It was divulged that most of the visitors were anxious to see the two high-speed 164-inch machines built by the Dominion Engineering Works at Lachine, with Harland patent interlocking speed drive. A



RIGHT ON THE JOB

Twenty-five seconds after Chief Berthiaume sent in the alarm, this company of fire fighters was on the spot, 10 seconds later the crew from another station thundered by. People in Three Rivers are proud of their police and fire departments.

fortuitous break in one of these machines presented an opportunity to study the control of the machine. The break was signaled quickly by a red light, and all incidental operations under a press-the-button control were accomplished with much less difficulty and more rapidity than with the ordinary machinery. (This drive has been described in The Paper Industry, February, 1921.) The power house, which with the generators now being installed will develop two hundred thousand horsepower, had many interesting features. The control room was high ceiled, so spacious and quiet that one observer likened it to a church. Here was, protected in a glass case, the original motor set installed in 1889, and still in good order.

The main control panel was arranged as a wiring diagram, with application and effects well lettered. From a portion of this panel street cars in Montreal, one hundred miles distant, were being controlled. The original twin falls are now both dammed, and the great rock with "grandmother's" profile has been removed and re-erected in a park in the town. This move suggests that one reason for the success of Laurentide lies in the value it places on human sentiment. The damming of the falls raised the river to such an extent that two falls, three and nine miles above, were obliterated.

Incidental to the power developments in the Saint Maurice, there is a large storage dam and reservoir at La Loutre, whereby the flow of the river is kept within a maximum difference of one foot all through the year; quite a contrast to the former ten to twelve feet range!

The enormous block pile is sprinkled continuously by high-powered hose streams located on the ground and on the high suspension conveyor. A gang of men is employed full time attending to this.

The afternoon was open, and members were given options on golf, tennis, further visits to mill or trip to Proulx forest nurseries, some few miles up the river. The nine-hole golf course was found by the enthusiasts to be of the sportiest, with fine natural hazards and well-kept greens. On the tennis courts it was noted that Secretaries Dawe of the C. P. P. A. and Kellogg of the Joint Executive on Education, made a good doubles team, despite the fact that Kellogg claimed to have played no tennis since 1912. Kellogg was the strenuous man of the party, and was seen, after tea and toast on the club-

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house verandah, to go off for a swim. Past experience had not taught him, as it had the writer, how very cold the Saint Maurice is in June!

Dinner at Laurentide Inn

In the evening the party was tendered a dinner at the Laurentide Inn. This was preceded by a band concern under the direction of Conductor Meyerbergen, on the terrace overlooking the river. One of the Laurentide staff in an airplane high over the falls added a fin de siecle touch to the glorious sunset review.

Owing to railroad arrangements, it was necessary to leave Grande Mere early in the evening, so Chairman Carruthers called for the speakers between courses. Mr. Wilson, speaking for the C. P. and P. A., called attention to the rejection of the Research Council's bill by the Senate, and asked the members to take an interest in the question to secure its passage at a future presentation.

Mr. George Williamson, president of the T. A. P. P. I., who spoke next, extended a cordial invitation to the joint fall meeting of that organization and the superintendents' association at Washington, Wilmington, Philadelphia and York Haven next October.

Mr. John Stadler of the Belgian Industrial Company spoke briefly, but in his usual humorous manner. He said he regretted that business would keep him away, but he assured to the Technical Section a great welcome at Shawinigan.

Then came some repartee between Mr. Wilson and Mr. Carruthers as to whether a Scotchman should say "by Jove" or "Begorra" when surprised.

Mr. J. N. Stephenson rose to say that this was the sixth summer meeting of the section, and we had never had a wet day or a dry meeting. He then moved a vote of thanks to our hosts, and added the names of the Belgian Industrial Company, Shawinigan, and our generous entertainers at Three Rivers. The motion was heartily second by Mr. R. S. Kellogg, secretary of the News Print Service Bureau and of the Joint Executive re text-books, who neatly complimented the Technical Section on its leading position. The motion was received and endorsed with high enthusiasm.

Belgian Industrial Co. Entertains at Shawinigan

At nine-thirty all made for the train, and in fifteen minutes were in Shawinigan, where we were immediately invited to an informal gathering in the assembly room of the Belgian Industrial Company. An hour was passed swapping yarns over bottles and biscuits. In our berths that night we were lulled to anything but slumber by an impromptu serenade to the tune of "Bubbles" in free verse, which ought not to have been liberated, in the opinion of some folks. The chorus follows:

"I'm forever having troubles,
Petty troubles all day long;
First it's the screens—then the paper breaks,
Get off again—the weight is wrong.
Always something doing,
Can't rest any more,
I'm forever having troubles,
And worse than I've had before."

The choir was not assassinated, but the chief of police was noted later watching our siding from his little red car.

Breakfast was served next morning at the Cascade Inn, with the generous Belgian company as host. Then the delegates were divided into groups assigned to guides with numbered white brassards, who drove us to the pulp and paper mill of the Belgian Industrial Company and conducted us through its various departments. One of the interesting features was an ingenious scheme for controlling feed of alum, size, and color to the stock, so arranged that valves would not work unless correct procedure were adopted.

With very practical foresight, the company had prepared a handsome souvenir folder, giving a brief history of the company and a complete specification of the mill equipment. We watched the twin seven-saw slasher mills at work and were not surprised to learn that they had a record of forty-seven thousand logs per day per unit; nor were we amazed at the wood storage capacity of eighty thousand cords, after seeing the block-pile and conveyor.

Another informal gathering in the meeting room with light refreshments and cigars gave opportunity for several interesting short addresses. Mr. Maurice Neilson, in the unavoidable absence of Mr. Stadler, welcomed the visitors on behalf of the company. He was followed by Mr. Tom Nuttall, M. B. E., a member of the recently formed Technical Section of the British Paper Makers' Association, who gave credit to Canada for leading the way in the formation of technical sections. He said they were working in the United Kingdom on educational matters, and looked hopefully to the series of text-books being published by the Joint Executive of the United States and Canadian technical men. His closing remarks were an invitation to visit London at the meeting of the British Technical Section. Mr. Carruthers acted as chairman, and his interpolated remarks were in characteristic vein.

The party was taken for a rapid swirl around the town of Shawinigan, led, as in Three Rivers, by the chief of police, reminding the members of Mr. Wilson's story of the Scotchman who lost half-a-crown in London, and after reporting the matter to the police, was shortly surprised to note men breaking up the paving near his hotel. Mr. Wilson quoted him as saying, "By Jove, these people are thorough." Mr. Carruthers, as mentioned before, took exception to a Scotchman saying "By Jove." The people of Three Rivers and Shawinigan saw to it that the thoroughness of our welcome precluded any chance pinching of papermakers for speeding, so had their chiefs assume responsibility.

Once more the Belgian company entertained us to a buffet luncheon served on the verandah and lawn of Cascade Inn, with a magnificent landscape of river and hills beneath us.

Shawinigan had two or three houses in 1898—it now has five thousand people, big carbide works, an aluminum plant, an electro metallurgical company, a brass and iron foundry, a splendid technical school, and supplies power to Montreal, Quebec and Three Rivers. It has charming residences, and from every point in its many hillside streets may be seen wide views of hill, forest and river.

Luncheon over, the delegates were driven to the station and pulled out for Montreal, concluding a most successful and profitable trip, notwithstanding the fact that no formal meetings or papers were on the program.

Fall Meeting, Cellulose Section of American Chemical Society

The president and secretary of the American Chemical Society have authorized another meeting of the Cellulose Section in connection with the fall meeting of the parent society in New York, September 6-10, 1921. Prof. Harold Hibbert has been reappointed chairman and Gustavus J. Esselen, Jr., secretary. This will be the fourth consecutive session devoted to cellulose and its derivatives, a symposium on the subject having been held in both St. Louis and Chicago and the first meeting of the Cellulose Section, as such, at Rochester last April. At this last meeting great interest was shown and there is no doubt that the Cellulose Section has made a place for itself in the activities of the American Chemical Society.

It is the plan this year to issue the preliminary program much earlier than on previous occasions and accordingly, those who plan to present papers before the Cellulose Section are urged to send the titles at once to the secretary of the section, G. J. Esselen, Jr., 248 Boylston St., Boston, 17, Mass.

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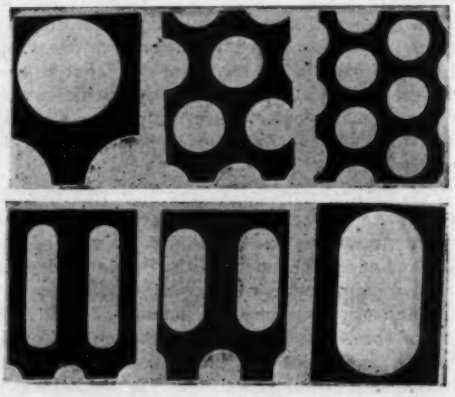

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Reserves for Self Insurance in Paper Industry

A Note on a Proposed Amendment to Income Tax Law

By N. F. ROSS, C. P. A.
Stein, Ross and Sack, Accountants, New York

ON May 27, the Senate Finance Committee closed a long series of open hearings on proposed tax legislation. By far the greater part of these sessions was devoted to the pros and cons of the sales tax. The income tax, as such, received sparse attention. Though the floor was open to criticisms and suggestions on all phases of the tax question, critics were few. There was talk of reducing individual surtax rates and the excess profits tax, but little was said about abolishing or changing the corporate income tax. This leads to the thought that the business world has possibly become completely adjusted to the tax and its intricate requirements in the computing of income, and that the present scheme is more satisfactory than is commonly believed.

One radical suggestion came from a representative of a paper concern owning standing timber. This suggestion called for an amendment to the income tax act to the effect that, "In the case of standing timber, a reasonable allowance for accumulation of an insurance reserve against losses from fire, insect or other cause . . ." be permitted as a deduction in computing income.

The need for such an allowance to provide "self-insurance" was argued in a statement filed with the Senate Finance Committee, which can be briefly summarized. First, owners of standing timber are practically unable to place insurance against loss. Under unfavorable conditions, no insurance company will take the risk. And where they will assume the risk, the rate for fire loss alone is at least 1½ to 2 per cent. This rate is prohibitive. Consequently, most of the owners remain uninsured.

This statement points out, further, that in many regions the danger from insects is even greater than the fire danger. Thus, a number of years ago, the balsam in the New England States was nearly all destroyed by insects. In the last two or three years, the forests of Maine and New Brunswick suffered severe damage from the spruce bud worm—the estimated loss in some localities being 50 per cent of the fir and 5 to 10 per cent of the spruce. And the ravages of the gypsy moth now threaten the standing timber of Southern New England.

Losses of this order do not spread themselves evenly or conveniently over time. Thus, heavy losses from fire are more likely to occur in periods of drought. Whereas, insects come like visits of epidemic. This unevenness and unexpectedness makes it difficult to anticipate the loss and its dire financial consequences. The only method, therefore, outside of insurance, is to create reserves out of profits by regular annual charges to income.

The statement closes with the remark that such a deduction for the creation of a reserve will make little difference in the amount of taxes to be collected and would place the "timber owner in the same position as owners of other kinds of property, who can insure their property and deduct the cost of insurance as an operating charge."

As Senator Penrose remarked at the hearing, this or similar proposals have been constantly urged upon Congress, and the tenor of his comment can hardly be said to be favorable to the passage of any such amendment at this time or in the immediate future.

Upon a moment's reflection, however, it can be seen that there is no bar, even at present, to a company making any such reserve, that it pleases and that its profits permit it to make. The only thing lacking is the right to treat the necessary reservations as operating charges. Also, under present rules, a loss actually taking place may be charged against the reserve. But for income tax purposes, notwithstanding that it is a charge against a reserve, it will be treated as a deduction for the year in which the loss actually takes place. Whereas, if annual deductions creating a reserve were to acquire income tax status, as is proposed, the total loss would be charged to the reserve and no amount in excess of the standard annual provision would be deductible.

The advantage one way or the other of these two alternatives depends purely upon the tax rates prevailing in periods in which reserves are being accumulated or actual loss is suffered. Theoretically, as an accounting matter, both methods should, in the long run, reach the same result. The only factor for variation is, as intimated, the changing tax rates.

Members of the paper industry will be interested in the official views of the Treasury Department in the matter of setting up such reserves under the present law. Congress is, of course, free to permit such deductions by specific enactment. But it is quite apparent that under present law no such deduction can be made by taxpayers. If Congress gives ear to the wishes of the owners of standing timber, there can be no doubt that it would be deluged with petitions to extend similar treatment to many other fields. In point is the experience of the canning industry with the present law.

In 1919, arguments similar to those summarized above were urged upon the Treasury Department in behalf of canners. They, too, pointed out that they were subject to peculiar conditions. And that, as a result, there is an alternation of abnormally high profits and abnormally low profits, depending on the alternation of favorable and unfavorable climatic conditions. They wished to equalize these profits by a scheme providing a species of crop insurance, calling for reserves and concurrent charges to operation.

The department, in a learned memorandum, held that the accumulation of reserves against future losses had no sanction in law. The only exception related to insurance companies themselves. But they, as is generally known, are subjected to rigid regulation and have developed scientific standards for anticipating loss. As to all other companies, no provision can be made for any possibility that is indefinite or contingent. Depreciation and obsolescence comes to mind at once. On this point the department asserted that the certainty of depreciation is unquestioned, and that the life of any given asset can be foretold with some semblance of accuracy. And besides, there is specific statutory authority for depreciation allowance.

A mercantile firm in Italy desires to purchase and secure an agency for the sale of caustic soda and chemical products in general. Quotations should be given c.i.f. Leghorn or Genoa. Payment to be made against documents. Correspondence should be in Italian. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35048.

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Draper Hollow Balanced Brass Balls

FOR STUFF PUMPS

Absolutely balanced; will not pound out of shape

Specify these when ordering new pumps.

Order these to replace worn-out balls.

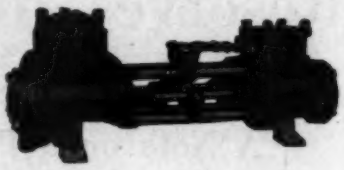
We also manufacture—

SOLID BRASS BALLS
IRON AND STEEL BALLS
BALL CHECK VALVES
VALVE FACING TOOLS

The Draper Manufacturing Co.

Port Huron, Mich. Petrolea, Canada

Every ball bears our registered trade-mark



Dean Bros. Durable Duplex Steam Pump Will Not Short Stroke

The steam cylinders on the Durable Duplex Pumps have half as many ports as are found on the old fashioned duplex pump. Single ports are made possible by the use of Dean Bros. patented Durable valve movement. This method of construction produces a very noticeable economy in steam consumption and is only one of the many advantages which have placed these pumps far ahead of any other duplex steam pump now manufactured.

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DEAN BROS. STEAM PUMP WORKS INDIANAPOLIS.

Disc Ventilating Fans

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Steam, Smoke, Vapors, Light Solids, Etc.

A genuine combination of durability and real efficiency.

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We build fans and blowers for every purpose.

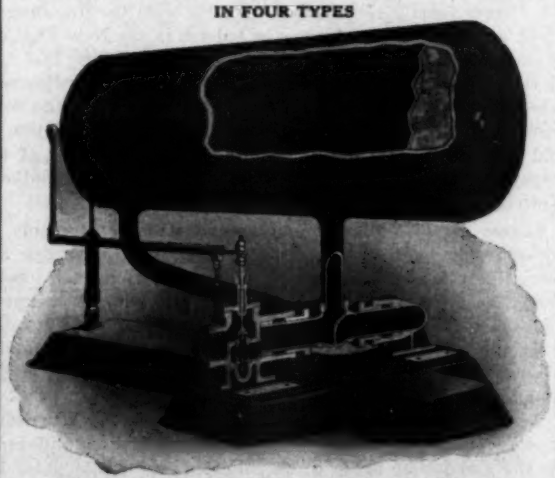
WHAT IS YOUR PROBLEM?

GARDEN CITY FAN COMPANY

McCormick Bldg. *Established 1870* Chicago, Ill.

The ELLIS AUTOMATIC TILTING STEAM TRAP

IN FOUR TYPES



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ESPECIALLY ADAPTED FOR PAPER MILL USES

The best trap made to remove the steam condensation from paper machine dryers. Works on a new and improved principle different from any other trap on the market.

Let us send you further information

THE ELLIS DRIER COMPANY

332 South LaSalle Street Chicago, Ill.

American Paper and Pulp Association Activities

A particularly interesting bit of assistance to owners of pulp wood land was given by the American Paper and Pulp Association when O. M. Porter, Assistant Secretary of the Association, was loaned as a technical forester to make a rough preliminary reconnaissance of some valuable timber lands in northwestern Maine. His brief survey showed that the land contained considerably more value in standing timber than had been supposed, and he advised in reporting on the conditions, that a forester be engaged to handle the property, after making a complete and accurate survey of the entire tract.

Dr. Baker Addresses Kalamazoo Chamber of Commerce

"We talk much of promoting home industries, and of spending our money at home—it is time that Michigan talks of her forest industries in a way commensurate with these possibilities. It is probable that Michigan is sending $50,000,000 a year down into the south and out west for material which she could grow on her millions of acres of idle lands."

This was the manner in which Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association discussed "The Forests and the Paper Industry of Michigan," in an address recently before the Kalamazoo Chamber of Commerce.

"Nowadays when people speak of Michigan, they too often think of automobiles. The general public, even of this state, does not realize the tremendous importance of the paper industry, an industry which now ranks seventh in the list of American industries in value of product, which has passed the billion dollar figure in value of product and in which Michigan mills play an important part. The state, with ten or twelve million acres of forest land, enough to take care not only of her present wood using industry, but to become in time an export state, as far as lumber and pulp wood is concerned, is now cutting only one sixth of her timber consumption. With an empire of idle land, the wood using industries are dependent in a way on forest products from outside the state.

"What Michigan is really doing for her forests could be told in a short statement. The two departments at Ann Arbor and Lansing at the two great colleges are doing excellent work, yet the amount invested in these activities is almost a joke, when one considers the returns to be derived by the state from building up again her devastated forest areas.

"Michigan's paper interests, not only in Kalamazoo, but other parts of the state, are not appreciated even in your own state. How many Michigan people realize that though a paper mill involves a great initial investment of capital before a single pound of paper can be produced, that there are fifty separate mills in the state and that there are forty separate paper companies? And in quantity of output these mills produce more paper than some other states with more but smaller mills. And 96 per cent of the paper made in the United States is made wholly or in part from wood which is decreasing in this country because we have not replanted the cutover lands, and for which we shall, unless we take steps to renew our forests, have to send our millions to foreign lands."

President Raybold Before Baltimore Typothetae

"Although I am speaking to you as the representative of the manufacturers of paper, I think we must all realize that there are three grand divisions of the paper industry, the manufacturing, the distributing and the printing industries, all important in themselves, but all interdependent."

This was the way in which W. J. Raybold, president of the American Paper and Pulp Association, discussed paper before the local organization of the United Typothetae of America at Baltimore, Tuesday night, June 28.

"These three grand divisions," he continued, "are repre-

Let your superintendent know his machines' performance.

He will make them do better.

ACCURACY
Tetco
PHILADELPHIA PA. U.S.A.

The Electric Tachometer Corporation

Philadelphia

Let your machine tender know his speed.

He will keep it right.

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EASTWOOD Wire Mfg. Co.

Fourdrinier Wires
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WE ALSO MANUFACTURE

Valves, Unions, Cocks, Fittings, Digester Parts, Castings, etc., for Sulphite Mills from Our Perfection Bronze

Largest producers in the world of highest grade Brimstone —guaranteed 99% pure—free of Arsenic and Selenium.

The UNION SULPHUR COMPANY

In so far as possible we will be glad to offer advice or suggestions to prospective buyers who are using or may be contemplating the use of brimstone.

17 BATTERY PLACE
NEW YORK

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

Have You Run Them?
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Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.

New Sand Filter

A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

Send for full particulars

Hungerford & Terry, Inc.
PHILADELPHIA, PA.

sented by three great trade associations, of which we all have reason to be proud. The manufacturers are represented by the American Paper and Pulp Association, the merchants by the National Paper Trade Association, and the printers by the Typothetae.

"Inasmuch as we are all sections of one great industry, the paper and printing industry, one of America's most important business groups, I believe that our general policies should be so harmonized that we can work together, all at times, perhaps, making some sacrifices, but in the end achieving the greatest good of the greatest number of individuals in all of the branches.

"The trade association has an important function in American business. Through its work, the individual escapes the pitfalls in the path of the independent enterprise. One individual concern is subject to all manner of chances for failure to achieve success. The association, however, by getting the best judgment of groups of men, eliminates the chances of error, and helps save the individual from the errors which, unaided, he might so readily make.

"There is a certain amount of unselfishness among the members, required of those belonging to associations. They make individual sacrifices at times, for the common good, but the greater benefits derived from cooperation in the final event more than make up for the small sacrifices which may be made occasionally.

"And the same rule applies to the three grand divisions of this industry of ours. By cooperation, we will all in the long run be the gainers."

Index Numbers of Paper Industry by Months for 1920-1921

Conditions in the paper industry reported by months for each month of 1920 and for the first four months of 1921 have been made public by the Department of Commerce in a table of paper index numbers.

The table was first discussed by Secretary Hoover with editors of business papers, and has now been released for publication.

The 1919 average is taken as the base, with 100 as the index number for that year. Index numbers are then given of production, shipments, and stocks of news print and all other paper, and production and stocks of wood pulp based on Federal Trade Commission Statistics.

The table is as follows:

Year and Month	—Newsprint Paper— Prod.	Ship'ts	Stks.	—All Other Paper— Prod.	Ship'ts	Stks	—Wood Pulp— Prod.	Stks
1919—Average ...	100	100	100	100	100	100	100	100
1920—January ...	113	112	71	130	128	70	107	74
February ..	100	90	117	112	106	80	94	70
March	112	112	115	128	131	73	116	70
April	112	117	91	126	121	81	124	77
May	113	111	95	129	132	73	129	88
June	114	112	100	131	133	67	120	87
July	113	115	92	132	130	69	111	79
August	112	110	103	131	130	68	108	68
September .	106	105	103	130	131	65	104	58
October ...	109	110	94	124	120	70	113	62
November ..	107	109	85	98	93	80	116	71
December ..	109	105	103	80	75	88	107	83
1921—January ...	108	101	135	74	67	101	98	97
February ..	90	84	164	76	71	109	86	104
March	94	91	175	83	77	119	93	117
April	101	106	147	76	75	120	95	132

Pittsburgh Man Named on National Forestry Committee

The work of the Pittsburgh Flood Commission for forestry in Pennsylvania has been recognized by the naming of that commission, as represented by Maj. W. M. Jacoby of Pittsburgh on the National Forestry Program Committee.

The Pittsburgh Flood Commission has been working for the establishment of forest areas on the headquarters of the rivers which meet at Pittsburgh, as the most important step in the

PIPING FABRICATED & ERECTED

—for example

This unusual piping fabricated and erected in an eastern mill typifies the unusual service we can render to users of piping in the paper industry.

The unusual problem in modern piping is the most usual task that comes to the M. J. D. Organization Headquarters. The most intricate design is not beyond the capabilities of our engineers. Our years of experience in fabricating and erecting piping systems for every purpose justify our claim to specialists in this work.

Concerns who rely on Dougherty Piping

A list of plants that have and continue to rely on M. J. D. piping service would read like a roll of honor of modern plant efficiency. A few are listed below:

Diamond State Fibre Co.
West Virginia Pulp & Paper Co.
Edison Portland Cement Co.
Virginia Carolina Chemical Co.
Union Mills Paper Mfg. Co.

Each of these installations was different—each an engineering problem. On one, a waste heat boiler installation, a **saving of 150 tons of coal daily** was effected. The same concern placed additional repeat orders including a water cooling system.

Our Increased Facilities—Quantity and Quality

Having recently acquired increased facilities by taking over a larger plant, we are now in a better position to offer our services to a larger field of clients.

As Piping Fabricators and Contractors we can handle your entire installation from the time you conceive it until it becomes a finished M. J. D. product. Or we can co-operate with your engineers, fabricating and erecting the piping according to your plans, or, we will furnish materials only. Our prices are right up-to-the-minute—LOW.

Let us send you our Bulletin N-7

M. J. DOUGHERTY CO.
PIPING FABRICATORS & CONTRACTORS
FACTORY & MAIN OFFICES—25th & WASHINGTON AVE. PHILA. PA.

HARDY S. FERGUSON
CONSULTING ENGINEER
200 FIFTH AVENUE NEW YORK CITY

Member Am. Soc. C. E.
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WATERTOWN, - NEW YORK
Special Sulphite Mill Equipping
Agents for the Heiskanen Pulp Bleaching Apparatus.

B. M. BAXTER
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5716 Euclid Avenue, Cleveland, Ohio
Engineering Service for Paper Mills
Construction and Production
BOOK, BOXBOARD, BONDS AND LEDGERS,
TISSUE, ROPE MANILAS AND SPECIALTIES

James L. Carey
Paper Mill Architect and Engineer
208 N. Laramie Ave., Chicago, Ill.

WINDERS and REWINDERS
SAMUEL M. LANGSTON COMPANY
CAMDEN, N. J.

THE
MANAGEMENT ENGINEERING AND DEVELOPMENT CO.
7TH FLOOR CITY NATIONAL BANK BLDG.,
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DESIGN, CONSTRUCTION AND OPERATION
OF
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(BOTH COMMERCIAL and FREE FROM IRON)
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M. AM. SOC. M. E.
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Do You Know That
Claflin Continuous Beaters
Have 3½ times the efficiency of other beaters in use today for Beating, Brushing and Refining Paper Stock?
For Increased Production, Greater Economy, Stronger, Finer, More Uniform Pulp, the CLAFLIN CONTINUOUS BEATERS will more than satisfy.
Ask Us for Our New Catalogue
THE CLAFLIN ENGINEERING COMPANY
LANCASTER, OHIO
The Canadian Fairbanks-Morse Company, Limited
Agents for Dominion of Canada.

prevention of the devastating floods which sweep the Ohio Valley.

Maj. Jacoby's first cooperation with the National Forestry Program Committee was when he appeared before a congressional committee early in January and aided in securing increased appropriations for national forestry development. Later the Pittsburgh Flood Commission and the Pittsburgh Chamber of Commerce endorsed the Snell forestry bill, which was sponsored by the committee on which Maj. Jacoby has been made a member.

Cost Association to Meet in Chicago

At a meeting of the Executive Committee of the Cost Association of the Paper Industry held at the Nyassett Club, Springfield, Mass., on May 17th last, it was definitely decided after some discussion to hold the next convention of the Cost Association in Chicago, Ill., on October 6th and 7th, provided that these dates did not conflict with any other arrangements made by the secretaries of other associations. It having been ascertained that such was not the case, these dates have been duly decided on. The Secretary-Treasurer will be glad to receive an suggestions as to speakers for this convention. Speeches will be limited to about twenty to thirty minutes apiece, in order that there may be plenty of time for discussion of each subject when the speaker has concluded his remarks.

In future the Cost Association will hold two conventions a year, one in May and one in October. Notices will be sent out shortly to all members proposing that the by-laws of the association be changed to this effect.

The Executive Committee, at its last meeting, had under consideration the question as to the policy to be pursued by the Association in the future. In the past it has been its policy, when urging manufacturers to install cost systems, to draw particular attention to their value as bases for use when determining selling prices, but lately it has become apparent that it is somewhat difficult to appeal to manufacturers on this ground, because in many cases prices have been fixed irrespective of manufacturing costs. Whilst the Association does not feel in any way that its former appeal was made on a false hypothesis, yet it believes that if it lays more stress on the value of cost systems in promoting efficiency and economical management in the mills, then perhaps manufacturers who have not yet realized the importance of cost systems may be more easily persuaded as to their usefulness.

The Secretary-Treasurer has been directed by the Executive Committee to work up through personal conferences, etc., a tentative questionnaire to be addressed to pulp and paper manufacturers with the object of helping them to ascertain whether they are above or below the average in manufacturing efficiency. All such information will be treated in the strictest confidence and used only for the purpose stated.

The Executive Committee also decided to send out another questionnaire to the members of the Cost Administration along the lines of the one sent out last year, asking for specific information regarding the cost systems now being used, if any, and particularly as to whether these systems are "tied in" with the financial books, as well as any other information regarding them which might be considered essential.

The following companies have recently joined the Cost Association: International Paper Company, and Cornell Wood Products Company.

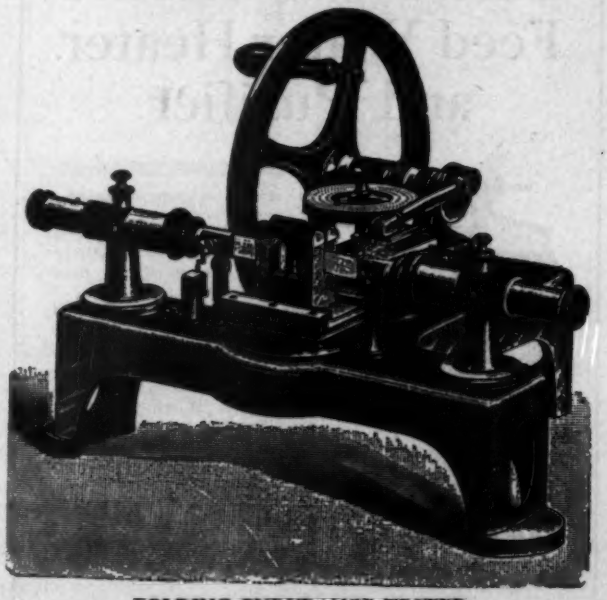
Kalamazoo Division Meeting

A very successful meeting of the Kalamazoo Local Division of the Cost Association of the Paper Industry was held on Saturday, June 18th, at the Dixie Inn, West Lake, at which the following were present:

H. Bradford, Jacob Kuss, F. A. Johnson, J. H. O'Connell and G. S. Davis of the King Paper Co.; G. T. Ingling and M.

SCHOPPER
Standard Paper Testers
—are the Best

STRENGTH AND STRETCH TESTER



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FOREIGN PAPER MILLS, Inc.
261 Broadway, New York

Trimbey & Allen

GLENS FALLS NEW YORK

Manufacturers of new, automatic, POWER and LABOR saving machinery, as:

The Allen & Trimbey Automatic Continuous Mixing Machine

The Allen Cooking Control for Chemical Pulp

The Trimbey Automatic Consistency Regulator

The Wells Improved Rotary Sulphur Burner

The Trimbey & Tibbitts Soft Stock Meter for metering Soft Stock Furnish to Beaters

"Vulcan Brand Means Superior Quality"

Vulcan TRADE MARK

DRYER FELTS

Standard or Multiple Warp

WON'T NARROW, WON'T SHRINK

WISCONSIN FOURDRINIER AND CYLINDER WIRES

COTTON AND RUBBER BELTING

COTTON CUTTER TAPES

FELT WASHING SOAP

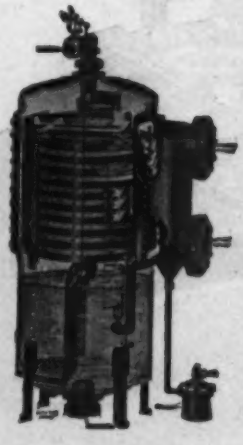
APRON CLOTHS

Morey Paper Mill Supply Co.

60 India Street

Boston Massachusetts

The New Stickle Feed Water Heater and Purifier



The reason we changed the construction of our heater from cast iron shell to a steel shell was to meet the demand of consulting engineers who specify an open heater to carry from 10 to 15 pounds back pressure. This is particularly necessary in Paper Mills for drying the sheet with exhaust steam. When you put this pressure on a cast iron heater built up of rectangular flat plates you have gone far beyond the limit of safety. That is the reason we use a heavy steel shell. The same principles of heating and purification are carried out as in our old heater.

Open Coil Heater & Purifier Company

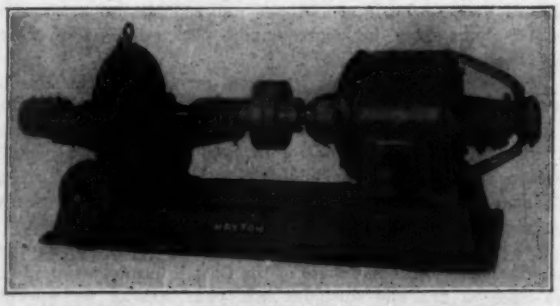
Indianapolis, Indiana

Boston Philadelphia

Hayton Centrifugal Pumps

SAVE POWER and MONEY

BY USING



HAYTON CENTRIFUGAL PUMPS

"With us it is an engineering problem"

Designed especially to meet the requirements of pulp and paper mills. We do not build a pump after OUR ideas and then try to sell it to you. We make a study of YOUR peculiar problems, and then build a pump to suit your needs. Hayton Pumps are built for hard, continuous operation, and will stand up under the most severe usage. We guarantee the highest efficiency, and maximum economy in power consumption.

We also build a full line of Sandusky Triplex pumps.

Let us have your specifications for quotations

Hayton Pump & Blower Co.

Manufacturers

APPLETON, WISCONSIN

Redmond of the Kalamazoo Paper Co.; J. Gordon, Roy L. Strong and W. Whightman of the Lee Paper Co.; H. F. Hunnell of the Sutherland Paper Co.; Wm. Allan, E. G. Milham and E. H. Gilman of the Bryant Paper Co.; Geo. H. Pountain, E. H. Coughlin and Paul L. Broesamle of the Monarch Paper Co.; C. W. McAlpine of the La Salle Paper Co. and Peter R. Bosker of the Rex Paper Co.

Addresses were given by Mr. Roy L. Strong of the Lee Paper Company and Mr. George H. Pountain of the Monarch Paper Company. Mr. Strong spoke in part as follows:

"In order to accurately figure the costs of our various grades and runs of paper, we must know definitely what goes into the beaters. It is not only important from the cost accountant's standpoint, but of course the superintendent is also vitally interested in this question, and let me here remark that the superintendent and head beater men should look at the cost man not as a necessary evil or, as an Irishman in our mill put it, "That damned emergency man," but as an assistant. Both the superintendent and the cost accountant are working to the same end, and the more co-operation there is between them the better the results will be. I will now give a short outline of how I think the desired results may be obtained with a minimum amount of extra work. In our rag room we use this form for each bleach of rags. Each bleach has a lot number and this number rides right along, so that we know when the rags are in the drainer just how much they have cost us. A record is made of the number of cars taken from each drainer, and in this way we obtain a cost per car.

"Pulp should be weighed in, tested and stored in a manner suitable to your own mill, also marked so that you may know the car and also the average dry weight per bale or bundle. If you are using a wet lap pulp it is a little more difficult to keep an accurate record. However, this may be done by dividing the car when unloading into a number of separate piles of uniform height with an average dry weight per pile. If the car should weight 30,000 pounds dry weight and you make 150 piles, your average dry weight per pile would be 200 pounds.

"If these two principal raw materials are handled in the foregoing manner the opportunities for error would be very small. For example, supposing we shall make a 50 per cent rag sheet and our beaters are of a thousand-pound capacity,—we are going to use 500 pounds of rags and 500 pounds of brown sulphite. The superintendent knows that the rags average 200 pounds dry weight to the car and the sulphite 100 to the bale, then his "furnish" to the beater man will be 2½ cars of rags and five bales of brown sulphite to the beater. The rosin and alum may be measured by pails or any other method convenient and accurate, but be sure that it is accurate. The beater engineer should keep a record of the number of bales, rolls or piles of sulphite and cars of rags used for each run or "furnish," and these records should be turned in promptly to the cost department when the run has been completed. All "broke" not used again in the "runs" should be weighed and credited to the respective "runs."

"In this manner the cost accountant ascertains the quantity of raw material used on the run and can determine the cost per cwt. of paper made. The cars of rags, of course, will vary in weight, but the cost is based on the number of cars in the bleach and all the costs of the bleach are taken care of. Records may also be kept so that the cost accountant is able to check up at any time and to know how much of any raw material he has on hand without an actual inventory."

Mr. Pountain then gave a description of the manner in which the Monarch Paper Company keeps track of its beater "furnishes," as follows:

"Our formulas are based on the dry weight of the pulp, etc., used in furnishing. The sulphite is tested for moisture when unloaded from the cars, and the number of rolls, bundles, or bales are counted, and since the total wet weight is known it

Blowing 20876 Sq. Ft. of Heating Surface

It is just as easy and convenient to blow the soot and ashes from the immense heating surface of the Colfax boilers as it would be if your boilers were also equipped with Diamond Soot Blowers.

Size of unit, extra width or type of boiler cannot affect the high efficiency and the thoroughness with which the soot is removed.

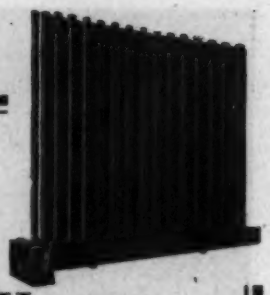
Clean heating surfaces save coal and increase boiler capacities. That is why the leading central stations and modern industrial plants have found it extremely economical to install Diamond Soot Blowers.

Let us tell you what they will do in your plant. Write for Bulletin 290

DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

SOOT BLOWERS - SAVE 4 to 8% FUEL



Bayley

Chinook Heaters

are giving reliable and economical heating service wherever installed. They are built on a tube within a tube design, free from elbows, return bends and nipples. Each tube a complete radiator in itself and replaceable without disturbing other tubes. Can be shipped K. D., thus saving freight.

Plexiform Fans

are built on perfectly balanced centers, run on ball bearings and deliver a maximum of air with a minimum of power and upkeep.

FREE

descriptive bulletin and consultation with Bayley engineers are yours for the asking. Ask today.

Bayley Mfg. Co.

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Do It with a Northern

Handle your paper with one of our Electric Hoists or Cranes and reduce handling costs. Tell us your problems

NORTHERN ENGINEERING WORKS

282 Chene Street DETROIT, MICHIGAN

The Yale Way

THE pan containing the small automotive parts which require heat treatment is swung on the hook of a Yale Spur-geared Block, hung from an I-Beam Trolley, over to the oil-quenching bath and plunged in without loss of time.

One man handles the whole operation. Your problem can likewise be solved by some unit of the Yale Hoisting and Conveying System — Chain Blocks, Electric Hoists, Trolley Systems and Electric Industrial Trucks, Tractors and Trailers. Write for the facts today.

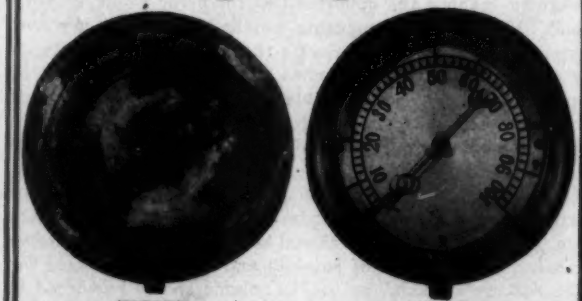
Yale Made is Yale Marked

The Yale & Towne Mfg. Co.

Stamford, Conn. U. S. A.

YALE Hoisting Conveying Systems

One Gauge Repaired Free



BEFORE AFTER

Specializing Pressure Gauge Repairing All Styles, All Makes, Including Pyrometer and Recording Gauges, Marine Clocks and Rev. Counters

REGARDLESS OF WHO MANUFACTURED YOUR GAUGES, Regardless of their CONDITION, we GUARANTEE to put them in First Class Working Condition

We request you to send one gauge to be repaired—no charge—as a sample of the quality and delivery of our work.

Immediate delivery of work that is uniformly excellent, at a satisfactory cost.

The Manning Gauge Company, Inc.

77 Traverse Street, BOSTON, MASSACHUSETTS

is thus possible to ascertain the average dry weight of each of the rolls, bundles or bales in the car, and this average dry weight is the basis used in "furnishing." In laps such as Oxford or Northern Michigan, etc., we count the laps in about six or seven truck loads in each car and sample them for moisture and then figure the dry weight per lap from that basis.

"The paper stock pumped into the beater is determined by deducting the weight of the other materials added in "furnishing" from the total weight. The clay is pumped into a large storage tank located high enough up so that it will gravitate to small measuring tanks placed by each set of beaters and measured and then run into the beater.

"The size is made in the basement and pumped to storage tanks located by the beater, and only the amount required for each beater is allowed to be drawn into the measuring tanks at one time.

"The alum is also mixed on the floor, but above the beater room, and is drawn off in small quantities in trucks, and then drawn to the beaters in small trucks.

"The stock man of course keeps track of all materials used, also the beater engineers keeps a record of all materials put into each beater. These records are collected each morning and the stock man's report examined to see if more stock is being furnished to the beaters than the formulas call for. As our stock men work 12 hours each, while our beater men work eight hours, it would always be the man on the other tour who was using more sulphite than the formulas call for. In order to know just who was using a surplus of sulphite, we have our stock man take inventory of all stock in the beater room at the beginning each tour. By so doing we are able to keep a close check on each man and to get as nearly an accurate cost on the "furnish" of each order as we think it is possible to get."

New Eastern Division Organized

An Eastern Local Division was recently organized by the Cost Association of the Paper Industry at a dinner meeting held at the Congress Square Hotel, Portland, Maine, on Thursday, June 23rd, which was attended by the President, Mr. S. L. Bush, and the Secretary-Treasurer, Mr. Thos. J. Burke.

Mr. Bush explained just what the Cost Association was trying to do, and why it was felt that it would be beneficial to the Eastern District if a local division were started there. Unfortunately owing to the fact that several of the association supporters were in New York at another meeting, the number attending was not as large as had been hoped, but those who were present were very enthusiastic about the advantages that would be gained by forming this division and holding regular meetings of the cost accountants in that district. An Organization Committee was formed, the members of which agreed to make arrangements for holding the next meeting at Augusta, Maine, on Wednesday, September 14th. The members of this committee are as follows:

Chairman, Mr. A. D. Pomeroy, Eastern Manufacturing Company.

Mr. J. E. Hyde, S. H. Warren Company.

Mr. H. E. Blackman, Pejepscot Paper Company.

Mr. L. G. Smith, Rogers Fibre Company.

Mr. J. E. Whitman, S. H. Warren Company.

Mr. L. J. Catheron, Eastern Manufacturing Company.

Any of the members of this committee will be glad to give you any further information that may be required regarding this matter, or it may be obtained from Mr. Thos. J. Burke, 18 East 41st street, New York City.

Arthur Pratt, president of the King Paper Co., Kalamazoo, Mich., recently received some threatening letters, demanding that he place $50,000 at a certain point. The letters were turned over to the sheriff, who later arrested the alleged writer of the letters, who was remanded in default of $2,000 bail.

BROWNHOIST

Increased handling capacity at one-half the cost

To double your handling capacity and at the same time cut the unit cost in half is certainly worth while. The Brownhoist locomotive crane shown above is doing this at the paper mills where it is working. This crane handles 85 thousand feet of timber per day at a cost of 70 cents per thousand. This is against 45 thousand feet at a cost of $1.48 per thousand under the former method.

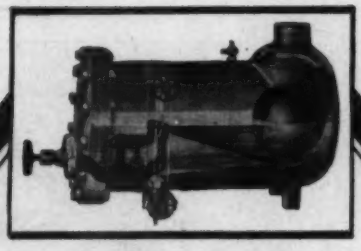
In addition to the speed and low cost of upkeep of Brownhoist cranes their great flexibility should be considered. Practically all kinds of materials can be handled anywhere as Brownhoists are made to operate on traction wheels or creeper trucks as well as railroad trucks. And the saving of handling materials by locomotive crane is usually as great or greater than the above.

Catalog K shows many types of Brownhoist cranes working in different industries. If you have any handling problems you will be interested in seeing how some Brownhoist owners are solving theirs. Write us. The knowledge of 40 years of crane building is at your service.

The
Brown Hoisting Machinery Co.
CLEVELAND, OHIO, U. S. A.

Engineers and Manufacturers of Heavy Dock Machinery, Bridge Cranes, etc., as well as smaller Cranes and Hoists

Branch Offices in New York, Pittsburgh, Chicago, San Francisco and New Orleans



A Steam Trap of Wide Range

Davis Traps are operating economically in paper mills wherever condensation is to be removed. In the illustration above, note the large float; sensitive leverage; valves and seats of Tobin Bronze; by-pass and working parts all attached to the cover and removable with it. Write to the G. M. Davis Regulator Co., 414 Milwaukee Ave., Chicago, for an interesting catalog.

DAVIS VALVE SPECIALTIES

STEAM SAVERS SINCE 1875

KNOW WHAT YOUR COAL BILL SHOULD BE

There's no longer any such commodity as "Cheap Coal," and indications are that there probably never will be again. At present prices, or for that matter—at *any price*—it is neither good engineering practice nor good management to check your coal by mine weights or railroad weights.

RELIANCE WEIGHING MACHINES

insure an *accurate* and *positive* check on every ounce of coal consumed. They provide a means, without additional labor cost, of checking the total received against the total purchased. They show to operator and executive the exact amount of coal consumed by each boiler. They bring efficiency and economy into coal consumption.

Weighs—records—indicates—without manual effort—the entire operation automatic.

Each machine is a unit in itself, so perfect in design and flexible in application that it will meet any existing plant conditions.

The services of our engineers are at your command in helping you plan prospective installations.

Write us for details.

RELIANCE WEIGHING MACHINE CO.

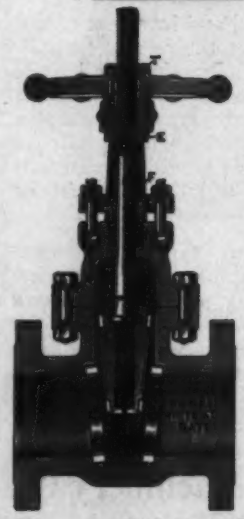
General Offices and Factory

LUDINGTON, MICHIGAN

Representatives in principal cities United States and Canada

POWELL VALVES

(Especially The White Star Valve)



Valves for Steam, Water, Gas, Oil or Air to meet every mining requirement.

Gate Valves with rising or non-rising spindles. Screwed or flanged ends, in brass, iron or steel.

If your dealer cannot furnish you with

Powell "White Star" Gate Valves

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THE WM. POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES.

CINCINNATI, O.

Smith Hydraulic Turbines

Illustration shows horizontal unit developing 2,400 horsepower under 42 feet head, at

88% EFFICIENCY

installed at Glens Falls, N. Y., Mill of International Paper Co.

Write Dept. "S" for Illustrated Bulletin

S. MORGAN SMITH CO., York, Pa.

Branch Offices:

BOSTON 176 Federal St. | CHICAGO 78 W. Monroe St. | MONTREAL 465 Power Bldg.

A. W. P. Co. Sends Paper Machine 1000 Miles for Display

Persons even slightly familiar with papermaking will appreciate the gigantic task involved in moving a complete paper-making machine, together with full beater equipment, several hundred miles for the exclusive purpose of displaying it at a convention.

As is well known, paper machines are huge, ponderous affairs. They weigh several hundred tons and extend the entire length of a mill. So huge and heavy are these pieces of mechanism, that instead of being installed in mills, as is true of nearly every other type of machinery, paper mills are sometimes built around the machines! One of the largest in the country, now used in making book paper at the Gill Division of the American Writing Paper Company, is over 250 feet in length, or approximately the length of an entire city block.

From this it is evident that to move a paper machine half way across the continent simply to show, by actual demonstration, how paper is made, is a sizeable undertaking.

Yet this is precisely what the American Writing Paper Company has done. The big paper-making organization has sent one of its machines, accompanied by beaters and other full equipment, to Chicago to be used at the Graphic Arts Exposition, which will be held in that city by the International Association of Printing House Craftsmen, July 23rd to the 30th.

Not the least surprising point of interest about this unique exploit, the first time a complete paper machine has been dismantled and shipped hundreds of miles for display purposes, is the fact that the machine in question is the smallest of its kind in the world. Instead of measuring over 200 feet in length, it is less than 9 feet long. Its total weight, including beater equipment, is but a fraction of that of its huge prototype. It is so light, in fact, that it can be easily shipped in a single automobile truck, and can be assembled and operated on an ordinary table. As a matter of fact, especially designed containers, resembling an ordinary piano case, made it possible to pack the entire machine and beater equipment in three cases!

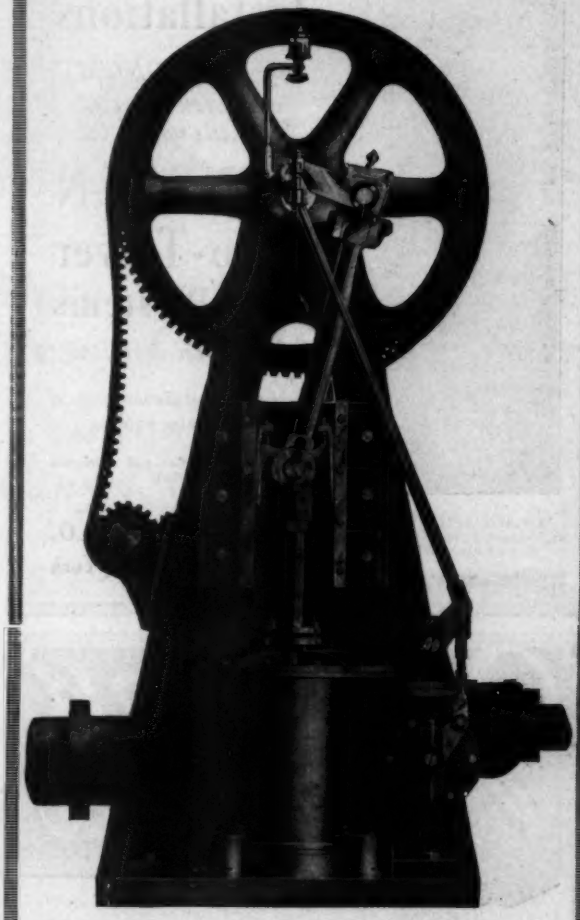
This miniature paper-making outfit, one of the most interesting of all the equipment of the American Writing Paper Company, is exactly eight and one-half feet from end to end. While several of the company's huge machines produce an expanse of paper almost one-half as wide as the average city street, the baby machine turns out a ribbon less than a foot in width—exactly 4 inches. This is considerably narrower than a letterhead, and approximately the width to which note paper is generally cut and boxed.

Despite its size—or lack of it—the tiny mechanism, however, is complete in every detail; it is an exact reproduction of the standard Fourdrinier machine, of which there are forty-three in the twenty-six mills of the big paper company. And persons who realize how many delicate parts can be incorporated in a machine 250 feet in length, will appreciate what it means to reproduce them in a device less than one twenty-fifth as large.

Although the world's smallest paper-making machine is decidedly limited in size and capacity when compared with one of full-grown proportions, no such handicap applies to the quality of its product. In this respect, it is the equal of the largest machine owned by the American Writing Paper Company. As far as quality of the product is concerned, it is impossible to distinguish the paper that winds rapidly through the delicate mechanism of the tiny paper-maker from that which is produced on the ponderous Fourdriniers. Nor is it limited in variety of output, as the model machine can produce anything from a bond paper to the heaviest cover paper or bristol board.

This interesting machine, the only one of its kind in exis-

High Efficiency Vacuum Exhausters



This exhauster is a well designed high efficiency piston displacement machine with extremely low clearance, showing indicator cards closely approximating the ideal for apparatus of this character.

The machine is simple in construction, of few parts which are easily accessible for oiling and adjustment, and is capable of long periods of continuous day and night operation without stopping for adjustment.

Write for further information.

Glamorgan Pipe & Foundry Co.
Lynchburg, Va.

JENSSEN ACID TOWERS
at Nekoosa Edwards Paper Co.
Port Edwards, Wisconsin

62 Jenssen Tower Installations

GREAT ECONOMY has been effected in mills where the

JENSSEN Two-Tower Acid Systems

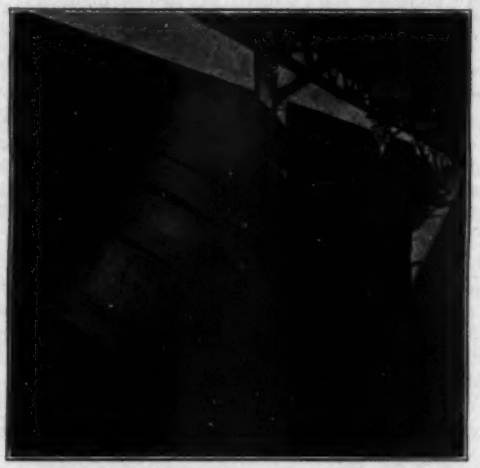
have been installed

Sixty-two Installations now in operation or building

U. S. A., Canadian and European Patents

G. D. Jenssen Co.
200 Fifth Ave., New York

A REAL Solution to Newsprint Handling



Picks up from either horizontal or vertical position a 72" roll or its equivalent in small rolls.
Stacks on end in car or warehouse.
Easy and simple to handle and will operate all day on a 25-cent charge of electricity.

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"Pioneer Builder of Electric Industrial Trucks"
Cleveland, Ohio, U. S. A.

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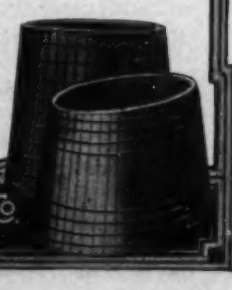
Of Exceptional Quality to Meet Every Requirement

We are tank specialists, producing scientifically made tanks that are guaranteed satisfactory in every case.

We are equipped to furnish tanks of any size for any purpose.

We Win With Quality

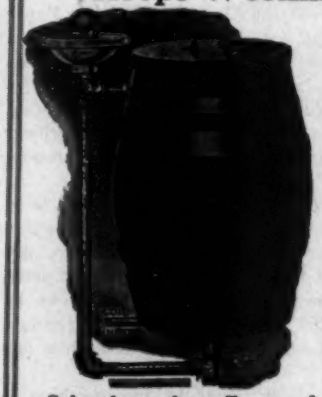
Pittsburgh Office
406 Bakewell Building



The HAUSER-STANDER TANK Co.
CINCINNATI, O. U.S.A.

Pure Drinking Water

Keeps Workmen Healthy



Physiologists agree that in order to keep the body in a normal state of health, a man should drink the equivalent of not less than seven glasses of water each day. Pure drinking water is a primary requisite for hygienic living and helps to keep the body free from all intestinal disturbances.

Stimulate the efforts of your employes and save their time in going to inaccessible hydrants by piping clear, cold water to them by means of Milwaukee's

"Famous" Cooler Fountains

This fountain includes a barrel of 1¼" thick oak, painted outside; cover of double thickness; galvanized pipe coil through which water passes to drinking head without coming in contact with ice, and a heavy vitreous china bowl with either cast brass bubbling head with self-closing stop or "Vertico-Slant" stream from which glass can be readily filled.

RUNDLE-SPENCE MFG. COMPANY
MILWAUKEE *Write for Catalog* WISCONSIN

tence, was purchased and imported from Europe by the American Writing Paper Company for use in development and investigational work. It is part of the Department of Technical Control, where experiments are constantly being carried on in order to establish improved methods of paper-making and to determine new uses of paper. The small machine will also be used at large and important printing and paper trade conventions. It is realized that nothing is so effective in teaching paper-making processes as actual demonstrations. For many reasons, however, it is impracticable to bring conventions to paper mills. The small machine enables the American Writing Paper Company to surmount this difficulty by bringing a veritable mill to the printer and other consumers of its product, in order to show—by actual demonstration—how Eagle-A standardized papers are made.

Manufacture of Pulp and Paper, Vol. Two

The second volume of a series of text books on modern pulp and paper mill practice, prepared under the direction of the joint executive committee on vocational education, representing the pulp and paper industry of the United States and Canada, has just been received.

Volume 2 is a preparatory volume on the essentials of the elementary sciences, and contains—Section 1, Mechanics and Hydraulics; 2, Elements of Electricity; 3, Elements of Chemistry. Anyone who is interested in paper making should have a copy of this book, as well as all of the other volumes as they come from the press.

Another Mill for Neenah, Wis.

Another new paper mill is to be added to the Fox River valley group with the organization at Neenah of the Valley Paper Mills, a corporation capitalized at $1,500,000 to manufacture glassine, grease-proof, onion skin and other special brands of paper. A new plant is to be erected at once.

Men well known to the paper industry are among the officers and directors. They are Albert C. Ehlman, Milwaukee, president; Emil Pohl, vice-president; G. W. Burnside, Neenah, secretary and general manager; William F. Wolf, Appleton, treasurer; William T. Fogarity, Green Bay, director.

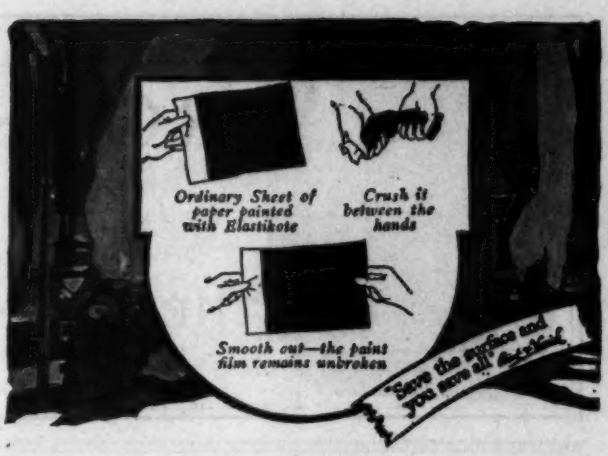
Neenah was selected as the location of the new mill because of its ready supply of labor, materials and its shipping facilities. A tract of 17 acres known as the "Blair spring property" has been purchased, on which to build a modern mill, which will be equipped with the latest machinery.

New Officers for Michigan Mills

Important changes have taken place in several of the largest paper mills in Michigan recently. On account of the death of Frank H. Milham, who was president of the Eddy Paper Co., when mills at Three Rivers and White Pigeon, Michigan, Oscar Gumbinsky has been elected to the position of president of this big organization. A. B. Thomas who for some years has been General Manager of the MacSimBar Paper Co. at Otsego, has been made General Manager, and Charles E. Nelson, who has held the position of General Manager of the Eddy Paper Co. for some years, resigned that position and has been elected President and General Manager of the MacSimBar Paper Co.

The management of both of these companies is in exceptionally good hands, as both Mr. Nelson and Mr. Thomas have had considerable experience in managing board mills.

The Telulah mill, which has been converted into a writing paper plant by its new owners, Fox River Paper Co., at Appleton, Wis., is about ready to start up. Workmen are busy on the new generator and driving equipment, the installation of which will be completed soon. Practically all the other machinery has been installed.


Ordinary Sheet of paper painted with Elastikote
Crush it between the hands
Smooth out—the paint film remains unbroken
"Save the surface and you save all"

Have You Made this FREE Test of ELASTIKOTE—

The Plant Maintenance Paint that:

Cannot Crack

Resists Acid Fumes

Lasts for Years

If you haven't made this free test of Elastikote; if you don't know about the millions of dollars it is saving yearly for many of the country's greatest industries—find out today!

Elastikote is the most economical paint you can buy. It withstands the gruelling conditions of smoke and acid fumes in industrial districts. It thoroughly protects the surface to which it is applied. It clings so tightly ruinous moisture cannot penetrate. And yet, because of its wonderful elasticity, it contracts and expands with the surface to which it is applied and does not crack.

Elastikote is our own special formula. It has been perfected through years of research and experiment. It has proved its value and its superiority by the test of time in hundreds of great industries.

Don't experiment with paint. It's costly—as costly and expensive as it is to neglect painting when your buildings need it.

Write now for this free test of Elastikote, list of great industries using it and our latest booklet, "How Pennies Protect Your Dollars."

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"The Firm that Serves with what Preserves"

TROPICAL

Paints—Enamels—Roofing Materials

PULP STONES OF QUALITY

IRONSIDES BRAND

THE CLEVELAND STONE COMPANY has a pulp stone quarry 50 feet in depth with sheets of rock 10 to 15 feet thick and can furnish any size stone now in use.

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Experienced man to take charge of Cylinder Machine on liner and filler board. 40 tons daily capacity. Apply, giving full particulars, to Box 28, Paper Industry, 356 Monadnock Block, Chicago, Ill.

Superintendent Wanted

Experienced Superintendent for Mill making all Rag Paper suitable for manufacture of Vulcanized Fibre. Replies should state experience. All replies will be treated as confidential.

Address Box 27, Care of Paper Industry

The Sandy Hill Iron & Brass Works

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Manufacturers of **Paper and Pulp Mill Machinery**

Big Oregon Concerns to Earn Reduction in Rate

Some of the largest contributors to the state industrial accident fund have formally notified the commission to the effect that they propose to take advantage of the opportunity to secure a reduction in rate for work in accident prevention, as provided by one of the amendments to the compensation law.

Included in the list are: Hawley Pulp & Paper company, Crown-Willamette Paper company and others.

The requirements of the amendment include the organization of safety committees and the carrying on of educational work in accident prevention. The amendment becomes effective July 1.

Big Paper Machine Starts Up

For a new paper machine to start up at a speed of from 800 to 900 feet is surely a record, but this was said to have been accomplished by the new machine at the plant of the Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis. The machine was built by the Beloit Iron Works, Beloit, Wis., and it is expected to ultimately be speeded up to 1500 feet a minute.

A decision to move the plant of the Kingston Paper Company in Little Falls, N. Y., to Niagara Falls, N. Y., was made at a recent meeting of the stockholders of the company. The reason for the move is the ability to obtain water power at a lower cost in Niagara Falls. The company manufactures principally roofing papers.

The first paper mill in the Canadian prairie provinces will be built at an ultimate cost of $5,000,000, as the result of a grant of 780 square miles of pulp forest east of Winnipeg to J. D. McArthur, head of the Manitoba Pulp & Paper Company. The company, under terms of the grant, must spend $1,500,000 within three years. The mill is to have an immediate capacity of 100 tons of pulp daily.

Dr. Sydney C. Wells of United States products laboratory says experts are at work in government laboratories at Madison, Wis., developing new process for using pine trees of the South in making bleached pulp.

Frank E. Holbrook, now with the International Paper Co. will become associated with the Combined Locks Paper Co., and Lakeview Paper Co., both of which will have their headquarters in Appleton, Wis.

The new plant of the Tomahawk Pulp & Paper Co., at Tomahawk, Wis., has started up with one machine. Later it is expected that another machine will be installed.

A large class of students have enrolled for the summer courses on pulp and paper making under the direction of Professor Ralph H. McKee, of Columbia University.

The 128 inch board machine in the mill of the MacSimBar Paper Co., at Otsego, Mich., is being rebuilt. A number of dryers, slitters and other new parts will be added.

The Gwynn's Falls Paper Company is the name of a new company which will build a $2,000,000, paper mill at Baltimore, Md.

The Central Illinois Paper Company is a new organization as Springfield, Ill., to deal in paper.

James A. Outterson is quoted as having said that within a year a new paper mill will be built at Ogdensburg, N. Y.

Remember

WM. A. HARDY & SONS

FITCHBURG, MASS.

Originators and Oldest Manufacturers

OF THE

Cast Bronze Screen Plate

ALSO SPECIALIZE IN

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Ticonderoga Machine Works

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WARREN IMPROVED CALENDER DOCTORS

With Flexible Blades, Universal Adjustment and Control

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WARREN IMPROVED PATENT DOUBLE DRUM WINDERS

Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties

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Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

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(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented

THE ORIGINAL THE BEST

SCREEN PLATES *and* DANDY ROLLS

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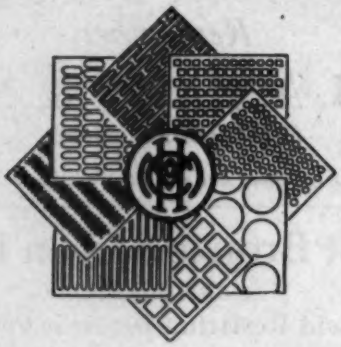
KALAMAZOO MICHIGAN



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in all metals for pulp and paper mills

Elevator Buckets (Plain and Perforated)

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Mechanical Filters

Will Deliver Clean Water

Gravity and Pressure Types

All Sizes to Suit Location and Conditions

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Norwood Engineering Co.

Florence, Mass., U. S. A.

The Ordway-Yaryan Evaporator

Save 20% to 40% of the steam now used by the evaporator

If you use a triple effect evaporator add two effects and save 40 per cent.

If you use a quadruple effect add one effect and save 20 per cent of the steam.

Present price of coal warrants the installation.

The MALONE BLACK LIQUOR FILTER saves pulp, evaporator cleaning, foaming and repairs.

CHARLES ORDWAY

25 Church St. New York City

Successor to The Yaryan Company

Rubber Covered Felt Rolls

DO YOU KNOW

That we cover Felt Rolls with Rubber that give better service than Brass Covered Rolls?

Our Rolls wear perfectly smooth. When once installed they require no further attention.

Write for names of satisfied customers using our rolls.

We Are Rubber Roll Specialists
Our Press Roll Stocks Are
the BEST on the Market.

The American Wringer Co.

Dept. R WOONSOCKET, R. I.

H. W. Caldwell & Son Company Joins Link-Belt Company

Charles Piez, President Link-Belt Company, has just released the following announcement which we are sending to you for your information.

The Link-Belt Company has acquired all of the capital stock of the H. W. Caldwell & Son Company, and Mr. Frank C. Caldwell has been elected a director of the Link-Belt Company.

Two experienced and successful companies in the conveyor world have thus joined forces, with the result that the Link-Belt Company has added two new lines, Helicoid Conveyors and power transmission machinery, to its line of manufactures.

While the H. W. Caldwell & Son Company's plant will continue to operate under separate corporate existence and under its present name, the joint facilities of the two companies, and the broader avenue of distribution of the Link-Belt Company, ought to prove of distinct advantage to the customers of both.

There will be no modifications of the policies of the Caldwell plant, no impairment of its service to its customers, no change in the diversity or character of its product.

The plant management will remain substantially the same, and the new owners like the old will proceed on the theory that the good will of its customers is the company's best asset.

Crane Co. Builds Unique Miniature Bridge

A novelty consisting of a bridge made of Crane valves and fittings to resemble the Tower Bridge in London, England, has recently been built at the Bridgeport, Conn., Works of Crane Co., and is now on display at the Crane Exhibit Rooms, 23 W. 44th St., New York. It will later be shipped to Crane-Bennett, Ltd., London, England.

15358 pieces taken from regular stock, comprising 230 different kinds of Elbows, Tees, Crosses, Nipples, Valves, etc., were used in building the Bridge. 16251 joints were required to make up the fittings, and it is worthy of note that not one left hand thread was used in the entire structure.

The Bridge is approximately 19 feet long by 11 feet high by 4 feet wide. The spans are 57 inches wide. It is of the Roller Lift Type having four towers, each tower being provided with one elevator. The lifts are 22 inches long by 30 inches wide.

Those who have had an opportunity to inspect the Bridge speak highly of it, and it is indeed an accomplishment to which Crane Co. may well be proud.

National Multiphase Renewable Fuse

Large industrial plants have been demanding and electrical manufacturers have been working for years to develop a means to prevent Multiphase Polyphase motors running single phase. Motor manufacturers have devoted most of their experiments to attempting to utilize a relay device in connection with the controlling apparatus, but inasmuch as the blowing of one fuse in a Multiphase circuit does not operate the circuit breaker or overload release, the motor invariably runs single phase. More motors burn out for this reason than from any other cause.

It is impossible to develop any kind of a relay system, as the voltage across the lines when one fuse blows drops to such an extent that there is not enough energy to energize the coils.

The Federal Electric Company of Chicago have developed with basic patent protection a low voltage auxiliary coil which is embodied in the renewable cartridge of National Renewable Fuses, and as the cartridge can go into the case in but one position, it easily makes the auxiliary connection with the fuse case itself.

Leads are then brought out for connecting the inter-phase

THE NEWPORT COLORS *for Paper*

Newport Direct Blue 2 B Conc.
is the Standard, economical blue dye for paper.

Newport Direct Pink 2 B
is a direct color of exceptional brilliance.

Your problems are of vital interest to us. It is to our mutual advantage for you to make use of our paper laboratories.

NEWPORT TRADE MARK "COAL TO DYESTUFF"

Newport Chemical Works, Inc.
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WHITAR TRADE MARK REG. U.S. PAT. OFF. News Blue Auramine

We Supply a Complete Line of

Aniline *and* Pigment Colors

for Paper Makers

SPECIAL SHADES OF COLORED PAPER OR SAMPLES OF DYESTUFF MATCHED AND COMPLETE FORMULAS FURNISHED

The White Tar Aniline Corporation
56 Vesey Street, New York City
Works: Kearny, New Jersey

INVINCIBLE PAPER & PULP CORPORATION

Agents for

Maine Pulp & Paper Co., Inc., Skowhegan, Maine
Cornwall Pulp & Paper Co., Ltd., Cornwall, Ontario
Specialty Paper Mills, Ltd., Camden East, Ontario

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E. J. KELLER COMPANY
INCORPORATED
200 FIFTH AVENUE
NEW YORK

FOREIGN AND DOMESTIC
PAPER MAKERS' SUPPLIES
CHEMICAL AND MECHANICAL PULPS
COTTON, JUTE AND FLAX WASTES
EAST INDIA MERCHANDISE

We specialize in raw materials for the manufacture of all grades of paper and offer from stock:

Casein
Casein Solvents
Vegetable Tallow
Chloride of Lime
Sulphate of Ammonia
Sulphate of Magnesia

COLORS *SIZINGS*

A. KLIPSTEIN & COMPANY
644 Greenwich Street
NEW YORK CITY

Books on Paper Manufacture

Subscriptions are being taken for the new Textbooks on the Manufacture of Pulp and Paper of the Joint Committee on Vocational Education of the Pulp and Paper Industry, a complete set of which should be owned by every firm or individual connected with the industry.

The set will be complete in five volumes. Volumes I and II, deal with arithmetical operations, elementary mathematics, drawings, etc. Volumes III, IV and V, to be issued shortly, will deal with pulpwoods and their preparation; manufacture of pulp; analytical methods; and paper manufacture in all its aspects.

Volumes I and II are now on sale at $5.00 a volume. In the selection of classroom problems bearing on the principles and practice of pulp and paper manufacture they represent the highest standard in textbook publishing.

Orders, with remittances, will be filled by Thomas J. Keenan, secretary of T.A.P.P.I., 542 Fifth Avenue, New York.

"World's Model Paper Mill" K V P Kalamazoo Vegetable Parchment Co. Kalamazoo, Michigan, U. S. A.

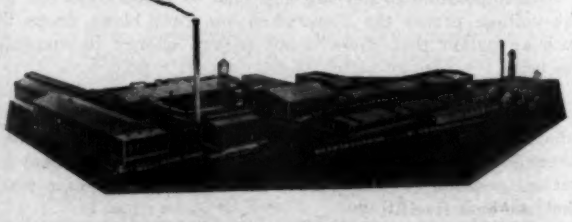
HISTORY OF PAPER

The first paper made was obtained from the pith of a rush or reed which grew along the shore of the Nile banks of Egypt. It was spread out like sheets and pressed flat and cemented together with its own sap. But after this was used a time it became scarce and expensive. Later it was obtained from goat and sheep skins. The first paper mill was built in Italy about 1150. The paper was made of raw materials, cleaned by boiling in lye, grinding or chopping into pulp and laying it on a surface to drain the water off and then formed into a sheet. The paper of the modern mills of today is made mostly of wood pulp or rag scraps and after being boiled it is rolled and then bleached.

JOHN VAN BRUGGEN,
8-5B Woodward Ave.

One of the frequent laudable efforts of Kalamazoo students on industrial subjects. Young America is preparing to "carry on." Every boy and girl should fully sense the relation and importance of the paper industry to the various walks of life.

All should, of course, know how the nation's foods are kept clean and pure in K. V. P. Genuine Vegetable Parchment and Waxed Papers. Write for the story.



circuit in either delta or "Y" connection and is made with either wire connections attached to the case for front connecting, or auxiliary knife-blade connections are attached for back connecting on panels, switchboards, etc.

National Multiphase Renewable Fuse, as the new device is known, serves two purposes. First, as a fuse it is so constructed that it withstands the high starting current of motors yet protects the running load within the limits prescribed by the Underwriters' Laboratories, Inc. It is powder-packed, which is the best known fuse practice. It has the metallic "tell-tale" indicator which shows in plain view upon the outside of the fuse the rated amperage of the element with which the fuse is loaded. As the fuse is made for operation on Multiphase circuit, it acts as a circuit breaker, that is, when one fuse blows, the auxiliary device in the National Multiphase Renewable Fuse makes one of the other elements in one of the other fuses blow, thereby breaking the circuit entirely and eliminating the possibility of the motor running as a single phase motor. This is really a time limit fuse and is absolutely fool-proof. They are built on the correct time limit principle and after once installed do not need any attention whatsoever until they have operated, and then the interruption caused by renewing the fuse is very slight.

We have received from the Beckett Paper Company, Hamilton, Ohio, a piece of advertising showing the embossing qualities of cover paper made by this company and reproducing the Fountain of the Great Lakes, a wonderful piece of statuary in Chicago. It is one of the best examples of embossing we have ever seen, and shows the high quality of this company's product.

Judge Hazen of the Federal Court at Buffalo, N. Y., has handed down an opinion sustaining the patent on Zeolite Water Softeners, manufactured by the Permutit Company of New York, and ordered an injunction against the Refinite Company. Full copies of the decision may be obtained from the Permutit Company, 440 Fourth avenue, New York City.

We are in receipt of bulletins from the Northern Engineering Works, Detroit, Mich., describing the line of bucket cranes made by this company. These are particularly interesting to anyone handling large quantities of coal, as most paper mills do. Copies can be had for the asking.

News Personals

John R. Ryan has joined the organization of the American Woodpulp Corporation, of 347 Madison avenue, New York, to take charge of the paper department of that concern. Mr. Ryan has been identified with the pulp and paper trade for a good many years, and has recently been with Arthur V. R. Thompson and Coale, Inc., both of New York City. The American Woodpulp Corporation, in conjunction with its pulp and rag business, will now handle paper manufactured by Scandinavian mills, making a specialty of news print.

Benjamin Gottesman, vice president of the Hudson Trading Company, of New York, was married on June 19 to Miss Esther Garfunkel at Long Branch, N. J. Mr. Gottesman and his bride will shortly sail for an extended honeymoon trip to Europe, where they will travel through the continent. Before returning home, it is Mr. Gottesman's intention to visit his company's connections abroad as well as the Stockholm office, the Hudson Trading Company Aktiebolag.

Peter E. King for many years identified with the paper jobbing business in Chicago, and formerly connected with paper making at Holyoke, Mass., died at his home at Wheaton, Ill., on July 7.

H. Christiansen has severed his connection with the Hart Trading Company in New York, for which he was manager of the import department, to open a branch office in London, Eng., for J. A. Kjellberg & Soner, of Gothenburg, pulp and paper dealers and exporters.

George Hager, for the past several years with the sales department of Eaton, Crane & Pike, of New York, and prior to that time with Parsons & Whittemore, Inc., also of New York, is now connected with the Poland Paper Company in its New York office at 200 Fifth avenue.

George M. McCarthy, for some time with the Eastern sales force of the American Writing Paper Company, has been transferred to the Chicago territory, where he will work with A. Carey Huls, manager of the Chicago office.

STANDARD BLEACHING POWDER

Manufactured by

Pennsylvania Salt M'f'g Co.
PHILADELPHIA, PA.

Fourdrinier Wires

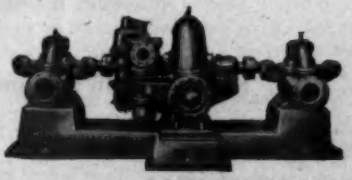
WISCONSIN WIRE WORKS

ALL MESHES OF PAPER MAKING *Wire Cloth*

APPLETON WISCONSIN

EARLE CENTRIFUGAL PUMPS

For Service Where Quality Counts



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HAMMERMILL

SAFETY
HAMMERMILL LEDGER
HAMMERMILL COVER
The Standard Utility Business Papers and the Most Widely Used Papers in the World
MADE BY
HAMMERMILL PAPER CO., Erie, Pa.
NEW YORK OFFICE: 231 BROADWAY

Lincoln Paper Mills
ELKHART, IND.

Manufacturers of

Machine Finish Writings

Machine Finish and Super Calender White and Colored Book

Extra Machine Finish and Super Calender Litho

Mimeograph and Specialties

The
Hinde & Dauch Paper Co.

Corrugated Fibre Shipping Boxes and Packing Materials of Acknowledged Superiority

Sales offices in principal cities

MAIN OFFICE
SANDUSKY, OHIO

WOLVERINE Paper Company

"Wolverine" Waxed Papers for Every Requirement

Best Quality

Waxed Tissue a Specialty

OTSEGO, MICHIGAN

JUNE and July are proverbially the quietest months of the year in the paper market, and the situation at present is not unlike that usually prevailing at this season. Demand for most grades of paper has simmered down to a very apparent degree. This is due not to any fundamental weakness of the market; on the contrary, the situation as it shapes up today is unquestionably healthier and of a more encouraging nature than at any time during the period of depression in the past year, but consumers have let up in buying because of conditions existing in their own fields and because this is the season when they are unalterably opposed to laying in stocks.

In other words, the present reaction is nothing more than seasonal and therefore but temporary. Indications are increasing that the paper industry is to experience fairly active conditions in the fall—consumers are freely inquiring concerning deliveries several months hence, and most signs point to improvement in paper consuming trades, thus leading to an appreciable increase in consumption of paper.

During the past several weeks, the inventory period has been at its height, which in itself has slowed up demand for paper. Consumers endeavor to reduce stocks to a minimum at this time and can hardly be prevailed on to buy a pound of paper or any other raw material they use unless having immediate need for it. Printing operations have been at their lowest, adding to the decrease in paper demand. Advertising has been on the decline, causing newspapers and magazines to reduce the size of their issues; all in all, every factor has been for a lessened consumption of paper.

A very optimistic feeling pervades the trade in regard to the outlook for the fall and winter. Nearly everyone is of the belief that the industry has passed through the worst, and that as soon as the customary midsummer period of dullness is over, market conditions will show steady and substantial improvement. The basis of this belief is that the business outlook generally is a great deal more favorable. Some industries, such as the woolen goods industry for example, are rapidly reaching a state of normalcy, and it is felt that when the summer is over and the customary autumn stimulation of demand occurs, the paper industry will share to its full measure in the expansion of trade activity.

A good many paper and board mills closed down during the first half of July, partly because of the business depression and partly to complete mid-year inventories and to make machinery repairs. This move is likely to make for a firmer situation later on, as the loss of production during the time mills were shut should be felt when demand broadens. The fact should not be lost sight of also that a large majority of users of paper, as well as jobbers and dealers, have purposely reduced their stocks to the bone. This should obviously lead to a quick improvement in demand upon mills for paper when the need for increased supplies arises. There seems little question that when jobbers finally regain confidence in the stability of paper prices and again begin to stock their shelves with something approaching the amounts of paper they normally carry, manufacturers will encounter a marked increase in demand from this one source alone. It is stated that should paper merchants in the various large distributing points of the country today purchase from mills but half of the quantity of paper they ordinarily keep in stock that mill stocks, which are at present considered by many as surplus supplies, would be entirely moved.

The labor difficulty in the news print industry has been practically cleared up. Mill owners and their employes have agreed to place the wage question in the hands of an arbitration committee, and at this writing the committee, composed of three representatives from each side and a seventh disinterested member, is investigating the facts bearing on the matter, while most of the news print mills have resumed operations. The news print market tone is far from strong, yet prices are holding fairly steady. The contract basis on roll news for the third quarter of the year is fixed at 4.75 cents a pound f.o.b. mill, and quotations on spot deliveries range around an average of 5 cents per pound at mills. Some supply of Scandinavian and German news print is being offered at comparatively low prices, down to 4.25 cents having been mentioned, but these offerings seem to be having little effect on the market.

Book paper manufacturers are readjusting wages in their plants. Those in the Kalamazoo district put into effect reductions ranging from 13 to 30 per cent on July 11, and similar cuts have been made elsewhere. Quotations on book papers have not changed to any important extent. Machine finished book is quoted at 6.50 to 7 cents per pound at mills, super at an average of 8 cents and coated at between 9.50 and 10.50 cents.

Fine papers are in a quiet market position and quotations are so irregular that it is difficult to ascertain what constitute actual market prices. The trend of values continues downward, however. Wrappings are in fair demand at a basis of 6.50 to 7 cents for No. 1 domestic kraft, and tissues, particularly coarse grades, are moving along at a moderately steady pace at approximately previous prices.

Boards have slumped in demand following a period of fairly active buying, and as is invariably the case with boards when the market narrows, prices have weakened. Plain chip board is selling in some cases down to $28 and $30 per ton f.o.b. delivery points and news board at $32.50 for filled and $37.50 for solid.

To Make News Print in Chicago

Chicago is to have a brand new industry, and one which promises to develop into an important addition to the city's commercial life. It will be the manufacture of news print paper. Work is now under way by the Waterway Paper Company on the first $1,000,000 unit of a $4,000,000 plant on South Kedzie avenue, between the drainage canal and the river. The site is 300,000 square feet.

A unique feature of this new industry will be that raw material in the shape of local waste paper stock will be used largely in the production of news print paper. Three-quarters of the annual output, or 7,500 tons, has been contracted for by the Daily News of this city, on a cost plus basis, for twenty years. Interests identified with the News control the new company. Walter A. Strong is president and E. M. Mendelson of Mendelson Bros. Paper Stock Co. is vice-president and treasurer.

The Fort Dearborn Trust and Savings bank has issued a $450,000 7 per cent bond issue on the property. Frank D. Chase, Inc., engineers, designed the plant.

PENN PAPER
& STOCK CO.

Assorted Waste Paper
in Large Quantities

240 North Front Street, Philadelphia

J. ANDERSEN & CO.

FREDERICK BERTUCH, SPECIAL PARTNER
21 East 40th Street, New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden;
Bergvik and Ala Nya Aktiebolag, Söderham, Sweden

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PAPER TRADING CO.
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Paper Mill Supplies
Dryer Felts, Paper Stock

RUSS GELATIN CO.
Factory—WESTFIELD, MASS.

MANUFACTURERS OF
GELATIN and GLUE
ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON
FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 301 Devonshire St. BOSTON, U. S. A

ESTABLISHED 1895
Daniel M. Hicks
INCORPORATED

FOREIGN and DOMESTIC
Rags, Bagging, Rope
and Waste Paper

Pulps, Chemicals, Colors,
Wires, Felts, Clay, Casein, etc.

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INCORPORATED
IMPORTERS *DEALERS*
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Paper Stock

Now Is the
Time to Buy
Our Raw Materials

Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.

Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.

Write us your wants and we'll gladly send further information.

Mendelson Bros. Paper Stock Co.
910 South Michigan Avenue, Chicago, Ill.
Long Distance Phones: Harrison 2840 and 5357.

Papermaking Rags

It is not uncommon for papermaking rags to slump in demand and to move down in price during the summer months, and the market at present is running "true to form." There is very little urgent demand for rag stock. Consuming mills are confining their purchasing to quantities directly required and are refusing flatly to anticipate forward needs. It appears highly likely that rag values will tend upward when the fall season arrives. At prevailing prices production is obviously limited, particularly under today's labor costs, yet paper manufacturers apparently feel that a better policy to pursue is to take their chances on the future rather than stock up at this time.

In one sense the technical position of the rag market is bullish. Indications are that accumulations in dealers' hands are below normal for this season of the year, and all reports agree that collections the country over have fallen off to no small extent. On the other hand, the fact should not be lost sight of that consumption in recent months has decreased to a marked degree, which should serve to offset the reduced collections of rags. Moreover, if reports are to be believed, there are large stocks of rags of various grades in Europe which dealers there evidently are holding in expectancy of a rise in the market here before shipping to this country. Should values become enhanced in the American market even to a slight extent, the probabilities are European dealers would immediately send sizeable supplies of rags here, which would fill in any voids in the domestic supply.

In the meantime, those consumers that are coming into the market at spasmodic intervals are securing rags at practically their own prices. Counter bids at substantial reductions from the figures asked by packers invariably are accepted, indicating that at least some sellers are anxious to liquidate their holdings. New cuttings especially are in slow demand, and prices on most descriptions have worked down to lower levels. No. 1 white shirt cuttings are readily available at 9 cents per pound at shipping points, and washables are offered at 4.50 cents, blue overall cuttings at 5.75 cents, fancy shirt cuttings at 5.50 cents and black silesias at 3.25 cents. Old whites are quotably lower, as are thirds and blues. Prices on roofing rags have steadily declined in recent weeks and now range between 75 and 85 cents per hundred pounds on No. 1 packing and 65 and 75 cents on No. 2.

Average quotations f.o.b. shipping points follow:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	9.00-9.50
White shirt cuttings, No. 2	6.25-6.50
Fancy shirt cuttings	5.50-5.75
Washables, No. 1	4.50-4.75
Unbleached muslins	8.00-8.50
White lawns	8.25-8.50
Overall cuttings, blue	5.75-6.00
Black silesias	3.25-3.50
Old Stock—	
Whites, No. 1 repacked	5.00-5.50
Whites, No. 2 repacked	2.75-3.00
Whites, house soiled	1.50-1.75
Whites, street soiled	1.25-1.50
Thirds and blues, repacked	1.75-2.00
Thirds and blues, rough	1.15-1.35
Black stockings	1.60-1.80
Lace curtains	4.50-4.75
Cotton canvas, No. 1	3.50-3.75
White cotton batting	1.50-1.75
Roofing, No. 1	.75- .85
Roofing, No. 2	.65- .75

Rope and Bagging

Probably the firmest and most generally sought item in the paper stock field is old manila rope. Mills consuming this material are buying in steady fashion and in comparatively good volume, and, unlike nearly every other description of papermaking material, quotations on rope show an upward tendency. Four cents per pound at shipping points is the price commonly quoted on domestic manila rope in No. 1 condition, but there have been sales to mills recorded at higher than this figure. Strings are in moderate call and are bringing between 85 cents and $1 per hundred pounds at shipping points.

Old bagging is lifeless. Consuming mills evince little buying interest, and aside from occasional shipments of single carloads—mostly on contract—there is virtually no business of consequence. Buyers can obtain bagging at whatever they are willing to offer, if their bids are within reason. No. 1 scrap is available at less than a cent per pound at shipping points, and roofing bagging at 50 cents a hundred. Gunny is quoted at from one cent per pound upward.

Fo.b. shipping point quotations are:

	New York and Chicago
Gunny, No. 1 domestic	1.10-1.30
Gunny, No. 1 foreign	1.00-1.25
Scrap bagging No. 1	.85-1.00
Roofing bagging	.50- .60
Wool tares, heavy	1.50-1.75
Wool tares, light	1.25-1.50
Manila rope, No. 1 foreign	3.75-4.00
Manila rope, No. 1 domestic	4.00-4.25
Sisal strings	1.75-2.00
Mixed strings	.90-1.00

Old Papers

Waste paper prices are holding fairly stationary. The tendency in a majority of cases is toward lower levels, this being due to a let up in demand from consuming quarters recently, but the fact that values already are on levels where there can scarcely be any profit to dealers in handling the commodity aids in maintaining prices to a more or less degree. There are several grades which for sometime have been moving in steady fashion and that are still sought in relatively large quantity by mills. These include old kraft, white news cuttings and soft white shavings, but the downward trend of wood pulp costs seems to be waging an unsettling influence on quotations on these grades, presumably due to some paper mills switching their buying from paper stock to pulp.

Low qualities of old paper are in a very unsatisfactory position, from the packers' point of view. Representative dealers argue, and doubtless rightly, that newspapers and mixed

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SULPHITE
BLEACHED **PULP** UNBLEACHED
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High Grade Printing Paper

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BOOK AND COATED PAPER
Car Lot and Tonnage Contracts

CASEIN

Standard Quality
Lowest Prices

The Casein Manufacturing Company

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IMPORTED **TALC** DOMESTIC

We are also Headquarters for:

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Dealers in Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
J. & J. Rogers Company, Au Sable Forks, N. Y.
Canadian Kraft, Ltd.
Dealers in Wayoganiack Kraft
Three Rivers, Canada

EASTERN AGENTS FOR
Port Huron, Michigan, Sulphite
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

Bleached and Unbleached

WOOD PULP

of Every Description

M. GOTTESMAN & COMPANY

INCORPORATED

18 East 41st Street NEW YORK, N. Y.

Established 1888

papers cannot be collected and prepared for shipment to mills on today's prices at a profit. Nevertheless, there is not sufficient demand to enhance values, and collectors continue to gather paper and sell it to consumers at the same low figures that have obtained for some months. Folded newspapers in the East are bringing no more than 40 cents per hundred pounds at shipping points, and No. 1 mixed paper only 30 cents, and while Western packers are generally securing slightly better prices, the difference is not enough to afford them much, if any, profit in handling the stock. Old No. 1 kraft continues to command 2 cents per pound at shipping points, and white blank news cuttings between 1.60 and 1.75 cents. Soft white shavings of No. 1 quality are quoted by dealers at 2.25 cents upward, and No. 1 hard white shavings at 3 cents. Heavy No. 1 book stock is a trifle lower, sales at 85 cents at shipping points having been recorded.

F.o.b. shipping point quotations follow:

	New York and Chicago
Hard white shavings No. 1	3.00-3.25
Hard white shavings Nos. 2-3	2.00-2.50
Soft white shavings	2.25-2.50
Colored shavings	1.00-1.25
Heavy book, No. 1	.85- .95
Crumpled No. 1	.70- .80
Ledger stock	1.60-1.75
Kraft, No. 1	2.00-2.15
Manilas, No. 1	.75- .85
White blank news	1.60-1.75
Overissue news, No. 1	.60- .65
Folded news	.40- .50
Mill wrappers	.60- .70
Box board cuttings	.35- .45
Mixed paper, No. 1	.30- .35
Common paper	.20- .25

Chemical Pulp

The chemical wood pulp market is lacking important trade activity and there is a decided downward tendency to quotations. Producers and dealers report that regardless of the efforts put forth they are unable to induce paper manufacturers to buy other than in hand-to-mouth fashion, and while transactions in the open market are fairly numerous, they seldom involve worthwhile tonnage and the aggregate amount of pulp being moved is smaller than is even ordinarily the case during the summer season.

One salient reason for the easiness existing in domestic pulps is the offering of sulphite by Swedish producers at sharp recessions in prices. It is reported on good authority that the Swedes have abolished their minimum price agreement and that efforts are now being exerted by manufacturers in Sweden to market at least a part of their accumulations of pulp at whatever prices can be secured. This leads consumers in the United States to expect a more or less flooding of the market here with Swedish pulp and prompts them to hold back in buying.

Bleached sulphite of No. 1 grade is to be had down to 5 cents per pound at pulp mills, and possibly this price could be bettered by buyers in some directions. Easy bleaching sulphite is offered at 3.75 cents, and No. 1 unbleached sulphite at 3.50 cents. News grade sulphite is about the firmest item in the list, but this grade also has eased off slightly, with offerings by producers at 3.25 cents noted. Soda pulp has declined sharply to 4.25 to 4.50 cents a pound, and No. 1 domestic kraft is freely available at 3.25 to 3.50 cents.

Quotations f.o.b. pulp mills are:

Bleached sulphite	5.00-5.50
Easy bleaching sulphite	3.75-4.00
Unbleached sulphite No. 1	3.50-3.75
News grade sulphite	3.25-3.50
Soda pulp, bleached	4.25-4.50

ALVAH MILLER, President TOM T. WALLER, Vice-Pres.
NATH'L L. MILLER, Sec'y-Treas.

CRAIG-BECKER COMPANY
INC.

Domestic and Foreign
Ground Wood
and Sulphite

52 VANDERBILT AVENUE
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BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

ARE NOW THE

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Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

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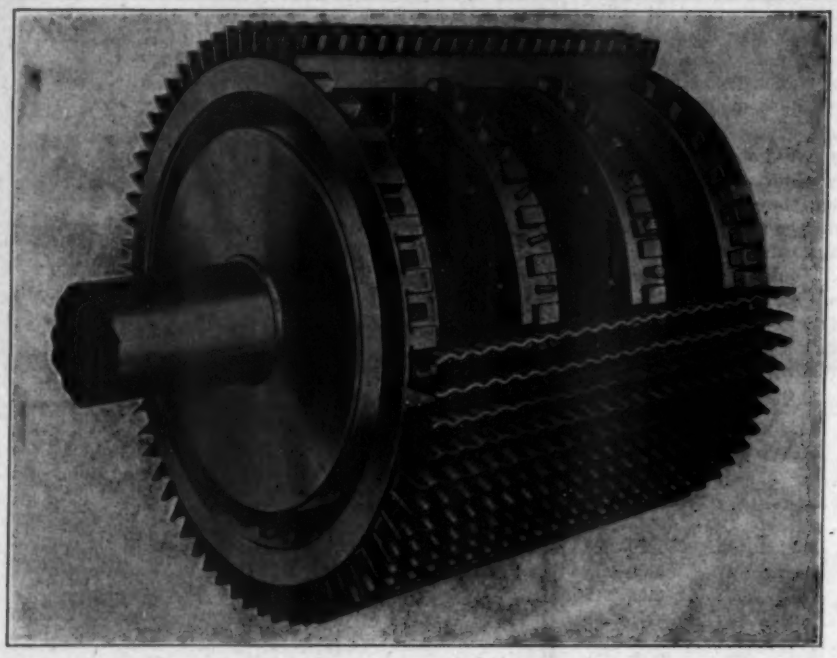

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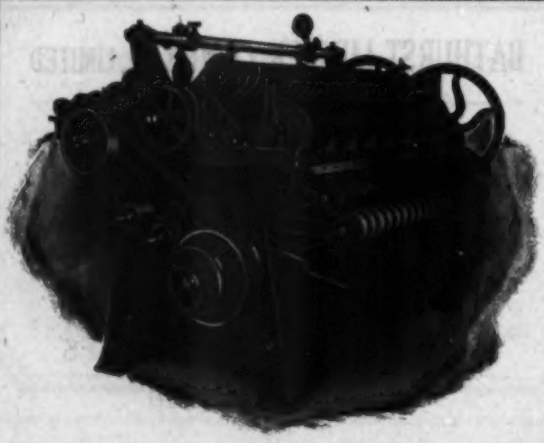
2. A bar designed for maximum strength.
3. Lugs on heads machine finished insuring a perfect fit.
4. Bars require no shimming.
5. Wedges self centering.
6. Wedges drawn down by heavy wrought iron bolts with brass nuts.
7. Nuts locked by ribs on cover plates.
8. Damaged bars can be replaced without disturbing the others.
9. It is unnecessary to raise roll from bearings when refilling.
10. Roll can be refilled in one-fourth the average time.

DAYTON GLOBE BANDLESS BEATER ROLL

WE SOLICIT YOUR INQUIRIES

DAYTON GLOBE IRON WORKS, **Dayton, Ohio**



PAPER CUTTERS

Single, Duplex, and Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

Hamblet Machine Co.
LAWRENCE, MASS.

"Dayton" Beating Engines are Built for Heavy Duty

Dayton Beater and Hoist Co.
DAYTON, OHIO

Mitscherlich unbleached	4.00-4.25
Kraft No. 1	3.25-3.50
Screenings, refined	1.00-1.25

Mechanical Pulp

As is usual in midsummer, the ground wood market is displaying a fairly firm undertone. This is due not to any heavy demand for mechanical pulp from consumers but to the fact that production has been reduced to a minimum owing to grinding mills having been compelled to shut down because of water conditions. This of course prompts owners of ground wood to hold back in offering out pulp and to demand higher prices, and there are numerous members of the trade who express the belief that if weather conditions such as have prevailed in recent weeks continue that prices on mechanical wood pulp will rise to much higher levels than now obtain.

Domestic grinders are asking from $30 upwards per ton for spruce ground wood of prime quality at grinding plants, and only in cases where the producing mill is situated far from consuming points and there is a high freight rate involved is ground wood to be secured for less today. Some offerings of mechanical pulp from Scandinavian sources at rather low prices, down to $25 a ton ex the dock on this side being mentioned, have been reported, but this phase of the situation seems to be having little or no effect on the domestic market.

Chemicals

Papermakers with few exceptions are managing to get along at present with contract commitments of chemicals in such a manner as to preclude the necessity of buying in the open market, and trade therefore is on a narrow scale. Chemicals are moving in steady fashion on contract but new orders are mostly for small amounts and are coming in infrequently. Quotations are irregular but no broad changes have occurred. Casein is available to mills at 8 to 9.50 cents per pound, caustic soda for spot delivery at 2.50 to 2.75 cents, soda ash at 1.75 to 2 cents, and bleaching powder in domestic drums for spot shipment at 2.25 cents. Quotations are:

Alum, lump ammonia	3.75- 4.00
Alum, lump starch	7.00- 7.50
Alum, powdered	4.15- 4.40
Blanc fixe, powdered	3.75- 4.00
Bleaching powder (domestic drums)	2.25- 2.50
Brimstone (ton)	15.00-16.00
Casein	8.00- 9.50
Caustic soda, spot delivery	2.50- 2.75
China clay, domestic washed	8.00-10.00
China, clay, foreign	12.00-16.00
Rosin, grade E	5.15-
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.75- 2.00
Sulphite of alumina, commercial grade	1.75- 2.00
Starch, papermakers', in bags	2.35- 2.50
Talc (ton)	16.00-18.00

Emanuel Salomon, president of A. Salomon, Inc., and widely known among paper manufacturers as a rag importer and dealer, has been elected a vice president of the American Woodpulp Corporation, of New York, and will hereafter direct the rag branch of the latter company's business. Offices of A. Salomon, Inc., have been moved from 15 Park Row to the offices of the American Woodpulp Corporation at 347 Madison avenue, New York.

A new concern by the name of the Main Company to pack and deal in all descriptions of papermakers' supplies has started in business at 25 Peck Slip, New York, where a large warehouse, five stories in height, is occupied. Joseph P. Gaccione, formerly connected with the Main Paper Stock Company, of New York, is at the head of the concern.

Let the Red-Arrow
Be Your Guide to Better Dyestuffs

The **Red-Arrow** is rapidly becoming recognized as the symbol of dyestuff excellence. When you purchase dyestuffs branded with the **Red-Arrow** you can always feel confident you are getting a dye with the highest tinting power and absolutely consistent in quality.

If you have a special dye problem or wish any particular formula, our service Department of Color Chemists will be glad to assist you without incurring any obligation on your part.

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INCORPORATED
Main Office, 19-21 North Moore Street, New York, N. Y.
Boston, Mass. Chicago Heights, Ill. Paterson, N. J.
Charlotte, N. C. Glens Falls, N. Y. San Francisco, Cal.

Red-Arrow Dyestuffs

Sulphate Alumina

All Grades for Paper Mills

Detroit Chemical Works

DETROIT MICHIGAN

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CADILLAC BRAND

A PERFECT SUBSTITUTE FOR IRON FREE

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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

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"The Wrapper that Delivers the Goods"

EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made from spruce grown in the forests of Northern Maine.

Send for Samples.

EASTERN MANUFACTURING CO.
501 Fifth Avenue NEW YORK

Folks Who Are "Extra Particular"

come to us because they know they will get meritorious goods, supported by conscientious service—all at the right price.

Send us a trial order for

BOX BOARD
and Paper Board Specialties

and you will be more than satisfied. Our service is broad and diversified—four "service stations" at your convenience.

The C. L. La Boiteaux Co.

CINCINNATI CHICAGO CLEVELAND NEW YORK

New Papers

Writing—	
White rag	14-40
White sulphite, No. 1	10-20
Colored	12-20
Ledger—	
White rag	15-50
White sulphite	12-25
Colored sulphite	14-25
Colored rag	17-50
Bonds—	
White rag	11-40
White sulphite	10-20
Colored sulphite	12-22
Colored rag	13-40
Book—	
No. 1 S. & S. C.	7.50- 8.50
Machine finished	6.50- 7.00
English finished	7.25- 7.75
Coated and enameled	9.50-10.50
Lithograph, M. F.	10.50-11.00
News Print—	
Rolls, contract	4.75- 5.00
Rolls, transient	4.75- 5.00
Sheets	5.50- 5.75
Side runs	3.75- 4.00
Cover Stock—	
Coated, both sides	9.25-
Coated, one side	9.20-
Wrappings—	
No. 1 kraft	6.50- 7.00
No. 2 kraft	6.00- 6.50

Boards—

	New York and Chicago
Solid news	37.50-42.50
Straw	40.00-45.00
Plain chip	28.00-32.00
White coated chip	55.00-60.00
Manila coated chip	50.00-55.00
Binders board	75.00-85.00

Name Seventh Man On Arbitration Board

Judge Frank Irvine, of Ithaca, New York, former Public Service Commissioner, has accepted appointment as seventh member of the Board of Arbitration to settle the strike of paper and pulp makers. Three members of the board were named by the unions and three by the paper manufacturers and Judge Irvine selected by these six.

The other members of the arbitration board are: Floyd L. Carlisle of the St. Regis Paper Company, E. B. Murray, Vice-president of the Union Bag and Paper Company, and Colonel C. H. Jones of the Spanish River Pulp and Paper Company, representing the mills; and J. T. Carey, President of the International Brotherhood of Papermakers, John P. Gurke, and J. T. Foster, an officer of the Dominion Trades and Labor Conference, representing the workers.

Striking employes of paper mills in this country and Canada have voted to accept the proposal made by manufacturers to submit to arbitration the wage dispute that caused some mills to shut down on May 1 and others on May 11.

The proposal of the manufacturers calls for the selection of an arbitration board of seven, three to represent employees, three employers and a seventh to be chosen as umpire by both sides. The board's findings will be retroactive. The ballot of the unions showed the men to be almost unanimous in favoring arbitration as a means of settling the strike.

The International Paper Company is not a party to the arbitration agreement. Eleven other concerns are.

A Fine Record

It is unusual under the present depressed conditions when most manufacturers are operating their plants from 20 per cent to 50 per cent capacity for a company to be able to say that for the past 12 months and, in fact, for the past six years, operations have been on a 100 per cent production basis.

The Sandusky Foundry & Machine Company has made such a record.

It is not an accident that the company has been operating full time during the last year, while many manufacturers have been more or less inactive.

The paper mill trade throughout the world recognizes as standard equipment the patented articles manufactured by this company on most modern paper machines thruout this country and Canada. The fastest paper machines in the world are equipped with suction rolls made at Sandusky. Over 700 suction rolls have been installed in paper mills in the United States and Canada and 100 in Europe.

Up to 12 months ago, the company confined its operations to brass and bronze. Within the past year a cupola for melting iron and electric furnaces for steel have been installed and iron rolls, locomotive cylinder liners, and all kinds of iron tubing, steel and nickel alloy metal are now being made by the same unusual casting processes formerly applied successfully to bronze.

The field for the company's cast products has been greatly broadened. During the year machine shop equipment was purchased and installed which more than double the capacity of the plant. Improvements were made in the shop as well as in the foundry and only recently the position of the company, from a manufacturing standpoint, was greatly strengthened by the purchase of adjacent property suitable for power plant and by a dock on the Lake Erie water front.

Nuera Paper Co. Discontinues N. Y. Sales Office

The Nuera Paper Co., of Hadley, N. Y., have decided to discontinue their New York Sales Office, which has been located at 200 Fifth Ave., of that city. All sales will hereafter be handled directly from the mill at Hadley, N. Y.

The mill is now shut down for extensive repairs and improvements, and operations are expected to resume in about another month. The new equipment will consist of: a 92 trim Cylinder machine for Boards and Heavy Weight Papers; a 56" trim Fourdrinier machine for Covers and Medium Weight paper; a 65" trim Harper machine for Light Weight Papers; a 40" Plater for Fancy Surfacing; and a 40" Roll Embossing machine.

Mr. A. B. Brown, manager of the Hinde & Dauch Paper Co., Ft. Madison, Iowa, is slowly recovering from a severe injury which he received on May 15. Mr. Brown was confined to the hospital, but has recently gone home. It may be a long time, however, before he is able to get back to his office.

We BUY JOBS and OVER-RUNS
OF
PAPER—CARDBOARD—BOXBOARD

The Sabin Robbins Paper Co.
ESTABLISHED 1884
Sales Offices: CHICAGO—NEW YORK—DETROIT—CLEVELAND—KANSAS CITY—ST. LOUIS
Warehouses: MIDDLETOWN, OHIO—CLEVELAND, OHIO

Bardeen Paper Co.
Otsego, Mich.

Printing Papers of Merit

For LETTERPRESS, OFFSET *and* LITHOGRAPHIC PRINTING

Offset Blanks Offset Bristols

Porcelain, Peninsular and Purity Enamel Book

M.F. and S&SC Book and Catalog

English Finish Opaque

Coated Blanks
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SWENSON EVAPORATOR CO.

Main Office	Eastern Offices	Works	
945 Monadnock Block, Chicago	519 Widener Bldg., Philadelphia	Angola, Indiana	Harvey, Illinois
	30 Church St., New York	Bedford, Indiana	Joliet, Illinois

Cable Address, "Evaporator Chicago," Western Union Code

EVAPORATORS

Wood Pulp

Lack of important demand from consuming quarters continues to be creative of a quiet and easy market situation in imported wood pulps. Paper manufacturers in the United States are purchasing very little foreign pulp. Occasional orders are placed at primary sources for sulphite or kraft pulp for shipment, and importers having stocks in store on this side of the Atlantic are now and then managing to dispose of hundred-ton lots, but on the whole, current business is of slight consequence and, as would be expected under the circumstances, prices are gradually moving to lower levels.

Papermakers appear to be imbued with the belief that they will experience no difficulty in obtaining the pulp supplies wanted when conditions in the paper market improve to an extent warranting increased production, and therefore are holding back in buying except when dictated by immediate necessity. Judging from recent advices from the Scandinavian countries, pulp consumers here have the situation correctly sized up. Nearly every report from the other side tells of accumulations of sulphite or kraft in producing centers, and of the slow demand prevailing in Europe for wood pulp. Manufacturers in Scandinavia also show a disposition to grant price concessions, so that buyers here are led to believe that by waiting they will be enabled to secure pulp later on at lower costs.

The situation in pulp today is attributable of course to the limited demand for paper of most grades and the light operations of paper mills. Paper manufacturers are undesirous of acquiring raw material of any kind in any large tonnage irrespective of the prices at which it is offered, and price therefore plays a minor part in the consummation of business at present. When trade activity in paper increases, it naturally follows that demand for pulp will broaden, and most members of the pulp trade confidently expect matters will improve to a substantial degree before the autumn arrives.

Offerings of spot lots of foreign bleached sulphite down to 5.25 cents per pound ex the dock have been noted, while easy bleaching sulphite is available at 4.50 cents and No. 1 unbleached sulphite at 3.75 cents. Some No. 2 unbleached sulphite has been sold at 3.25 cents, while Scandinavian kraft pulp is available at 3.50 cents. Offers of imported ground wood at low prices have been reported, down to $25 a ton on the dock being mentioned.

Arrivals at the port of New York in June and nominal current spot market quotations follow:

Bleached sulphite	$ 5.25- 5.75
Unbleached sulphite, No. 1	3.75- 4.00
Easy bleaching	4.50- 4.75
Mitscherlich unbleached	4.00- 4.25
Kraft	3.50- 3.75
Ground wool, per ton	25.00-30.00

A. J. Pagel & Co., 7,000 bls. from Gothenburg, 2,000 bls. from Hamburg and 1,200 bls. from Wallvik; E. C. Melby, 1,500 bls. from Christiania; American Woodpulp Corp., 1,000 bls. from Hamburg; Woodpulp Trading Co., 540 bls. from Gothenburg; National City Bank, 250 bls. from Gothenburg; Fred Enders & Co., 500 bls. from Gothenburg; Order, 338 bls. from Gothenburg and 600 bls. from Christiania.

Paper Stock

Importations of paper-making material into the United States during June dropped off to almost nil and clearly reflected the situation prevalent in the paper industry of the country. A few shipments of old rope and rags were landed at New York, but no old bagging or miscellaneous paper stock of consequence was received through this port during the month. Owing to the uncertainty existing in the trade, importers as a rule are confining operations solely to goods actually ordered by mill customers, and few mills are doing much buying, finding that they can readily fill present wants through purchases of domestic material.

It stands to reason that with the movement of paper stock from Europe to this country at a very low point for the past half year or longer stocks are piling up on the other side, which is having a weakening influence on prices. It remains to be seen whether a broadening of demand from consumers here would serve to advance quotations at primary centers, though a consensus of opinion among buyers on this side is that it would require quite some buying before values would be appreciably affected.

Receipts of paper stock at New York in June follow:

Old Rope

E. J. Keller Co., 140 bls. from Algiers; Brown Bros. & Co., 334 coils from Hull; W. Schall & Co., 176 coils from Barcelona; International Purchasing Co., 169 bls. from Havre and 116 bls. from Marseilles; Mechanics & Metals National Bank, 105 coils from Marseilles; Order, 37 coils from London.

Old Bagging

Order, 97 bls. from Antwerp.

Rags

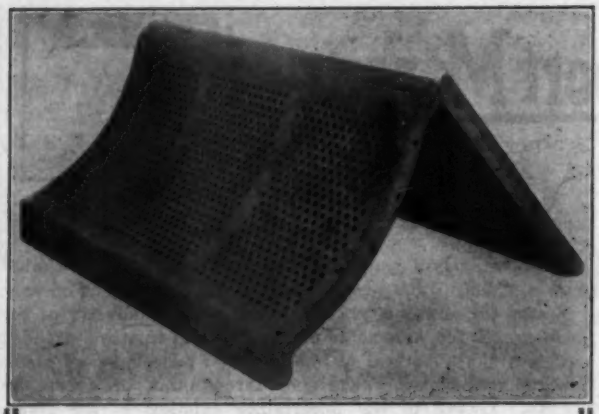
Ladenburg, Thalman & Co., 296 bls. from Hamburg; Jaffe & Co., 37 bls. from Havana; E. J. Keller Co., 60 bls. from Algiers, 110 bls. from Marseilles and 264 bls. from Havre; American Woodpulp Corp., 258 bls. from Hamburg; Maurice O'Meara Co., 212 bls. from London; State Bank, 145 bls. from Hamburg; Equitable Trust Co., 237 bls. from Oran; Bank of New York, 70 bls. from Antwerp; National City Bank, 68 bls. from Havre; Castle, Gottheil & Overton, 238 bls. from Antwerp.

Miscellaneous Paper Stock

Ladenburg, Thalman & Co., 161 bls. from Hamburg; Order, 142 bls. from London.

Paper

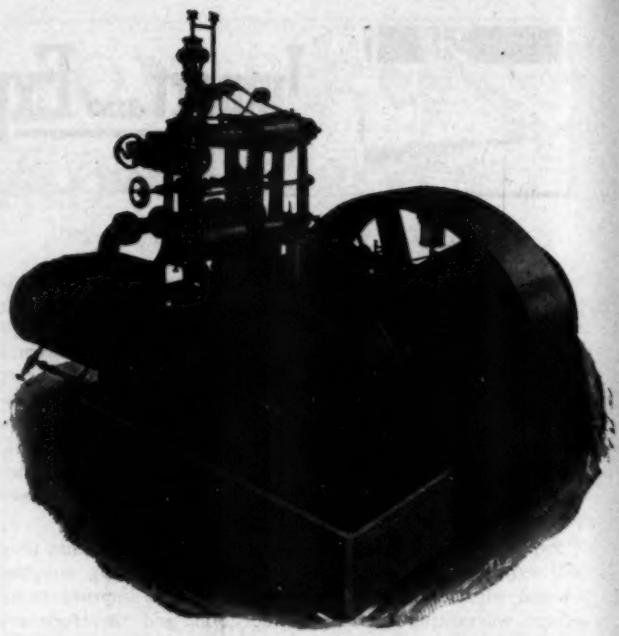
U. S. importations of finished paper in June, as indicated by receipts through the port of New York, were devoid of interesting feature. The usual amounts of cigarette, filter and hanging papers from European sources arrived, and there were fair-sized quantities of printing papers and box boards. Imports of roll news print were a little larger than in the preceding month, amounting to approximately 9,000 rolls at New York, against about 2,000 rolls received in May. Possibly the feature of the month's imports was the shipments of paper boards from Germany, which, while totalling no exceptionally large volume, were fairly numerous. Arrivals of the various descriptions of paper at the port of New York in June follow:



Because there are no moving parts this is a very simple but very efficient device. Patent No. 1,271,426 issued to Mr. Brownell Buehler, July 2nd, 1918.

The Shartle Continuous Beater Company

MIDDLETOWN, OHIO

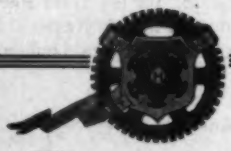


Variable Speed Engine

The engine illustrated above is especially designed to drive paper machines, giving continuous and reliable service. A patented safety device protects your employees and plant.

THE BROWNELL CO., Dayton, Ohio

SEND FOR BULLETIN E-4



It Floats on Oil

THE shafting fairly floats on a permanent oil film when held by Hill Collar Oiling bearings.

The oil is elevated continuously from lower reservoirs and is evenly distributed along the full length of the journal. This provides a permanent unbroken cushion of oil that insures continuous efficient operation.

Cleveland Type Hill Collar Oiling Bearings are furnished in every style of standard ball and socket or rigid mounting. Send for catalog.

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General Office and Plant, Cleveland, Ohio
New York Office, 50 Church Street

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CHIPPER and BARKER KNIVES;
RAG CUTTER, ROTARY CUTTER and PAPER TRIMMING KNIVES,
FLY BARS and BED PLATES for BEATERS and WASHERS,
JORDAN ENGINE FILLINGS,

THINK OF

BOLTON QUALITY

JOHN W. BOLTON & SONS, Inc.
LAWRENCE, MASS.

Intensive specialists in the manufacture of uniformly high grade machine knives for the pulp, paper and board industry

Cigarette

R. J. Reynolds Tobacco Co., 1,030 cs. from Bordeaux; P. J. Schweitzer, 90 cs. from Bordeaux; American Tobacco Co., 750 cs. from Bordeaux; Rose & Frank Co., 65 cs. from Havre; Surbrug Co., 14 cs. from Havre; Camancho, Roldan & Van Sickel, 137 cs. from Havre; Van Oppen & Co., 109 cs. from Havre; B. E. Teale, 47 cs. from Lisbon; Commission Company of Tokio, 100 cs. from Tokio.

Printing

Chemical National Bank, 1,086 rolls from Christiania; Irving National Bank, 50 rolls from Gothenburg; C. Steiner, 9 cs. from Hamburg; Charles Scribner & Sons, 2 cs. from London; New York American, 5,095 rolls from Gothenburg; National City Bank, 188 rolls from Hamburg; B. F. Drakenfeld & Co., 35 cs. from Liverpool; National Bank of Commerce, 1,014 rolls from Rotterdam; United Fruit Co., 6 bls. from Antwerp; Irving National Bank, 185 rolls from Christiania and 91 rolls from Copenhagen; R. F. Lang, 996 rolls from Hamburg; H. Reeve Angell & Co., 97 rolls from Kotka; Globe Shipping Co., 95 cs. from Hamburg; P. Puttmann, 22 cs. from Antwerp; Oxford University Press, 10 cs. from Liverpool; Order, 3 cs. from Genoa and 89 rolls from Christiania.

Wrapping

Republic Bag & Paper Co., 316 rolls from Hamburg; Foreign Trade Banking Corp., 773 rolls from Hamburg; Continental Shipping Corp., 2 cs. from Hamburg; H. Reeve Angell & Co., 2 cs. from Hull; Order, 23 cs. from Hamburg.

Hanging

W. H. S. Lloyd & Co., 21 bls. from London; Prager Co., 2,404 pkgs. from Antwerp; A. C. Dodman, Jr., 4 bls. from Liverpool; R. F. Downing & Co., 26 cs. from Victoria; Bech, Van Siclen & Co., 11 cs. from Victoria; M. J. Corbett & Co., 2 cs. from Rotterdam.

Writing

Meadows, Wye & Co., 7 cs. from Liverpool; A. C. Fetterolf, 8 pkgs. from Liverpool; Goodman & Levy, 6 cs. from Havre; J. W. Hampton, Jr. & Co., 70 cs. from London; E. Dietzgen & Co., 63 cs. from Marseilles; Order, 30 cs. from London.

Drawing

Lunham & Moore, 8 cs. from London; Keuffel & Esser Co., 59 cs. and 226 rolls from Hamburg; Canson & Montgolfer, 6 cs. from Havre.

Tissue

F. C. Strype, 9 cs. from Liverpool; Meadows, Wye & Co., 14 cs. from Liverpool; R. Hoe & Co., 3 bls. from London.

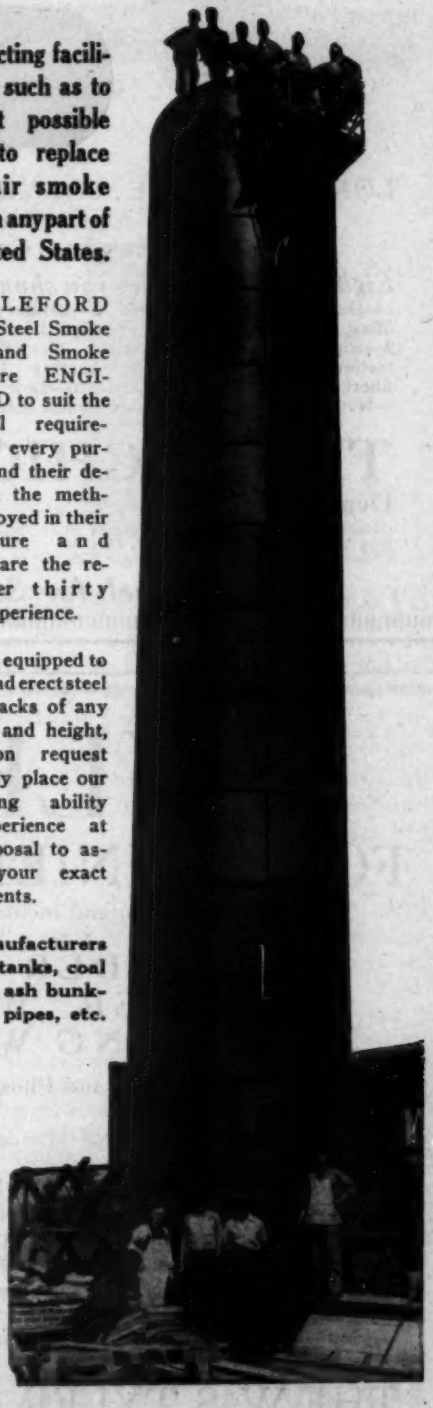
Filter

Lunham & Moore, 16 cs. from London; A. Faigger & Co., 1 cse. from Gothenburg; American Express Co., 42 cs. from Marseilles; E. Fougera & Co., 107 cs. from Bordeaux; C. G. Euler, 10 bls. from Bordeaux; Bernard, Judae & Co., 42 bls. from Bordeaux; Druggists Supply Co., 20 cs. from Bordeaux.

Boards

A. H. Ringk & Co., 4 cs. from Bremerhaven; U. S. Forwarding Co., 81 cs. from Hamburg; Metropolitan Import & Mfg. Co., 66 cs. from Hamburg; Crescent Textile Supply Co., 25 bls. from Gothenburg; Graef & Russel, 12 cs. from Hamburg; H. Diesroth, 5 cs. from Hamburg; Bendix Paper Co., 99 cs. from Hamburg; A. Steinhardt & Bros., 9 cs. from Hamburg; Prager Co., 42 cs. from Hamburg; Hensel,, Bruckmann & Lorbacher, 4 cs. from Hamburg and 4 cs. from Christiania; L. A. Salomon & Co., 4 cs. from Antwerp; American Thermoware Co., 4 cs. from Hamburg; W. Beese, 9 cs. from Hamburg; Bernard, Judae & Co., 3 cs. from Hamburg; Phoenix Shipping Co., 4 bls. from Hamburg; G. Joseph & Co., 41 rolls from Hamburg; Lagerloef Trading Co., 6 cs. from Helsingfors and 3 rolls from Kotka; W. B. Wheeler

SMOKE STACKS
BREECHINGS
TANKS



Our erecting facilities are such as to make it possible for us to replace or repair smoke stacks in any part of the United States.

LITTLEFORD BROS. Steel Smoke Stacks and Smoke Flues are ENGINEERED to suit the individual requirements of every purchaser, and their design and the methods employed in their manufacture and erection are the results over thirty years' experience.

We are equipped to furnish and erect steel smoke stacks of any diameter and height, and upon request will gladly place our engineering ability and experience at your disposal to ascertain your exact requirements.

Also manufacturers of steel tanks, coal bunkers, ash bunkers, coal pipes, etc.

LITTLEFORD BROTHERS
500 East Pearl Street Cincinnati, Ohio

"MICHIGAN" Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

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Boston, Mass.....93 Broad St.
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Montreal, Que., Canada..204 St. James St.
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"TYLER"

FOURDRINIER WIRES

"In all widths up to and including 250 inches"

CYLINDER FACES
WASHER WIRES
BACKING WIRES

In Brass, Bronze and Phosphor Bronze

Tyler Fourdrinier Wires are dependable, reliable and durable.

The secret of durability is found in the special composition metal that is used in the make-up of the wire, and by reason of its substantial construction a long life with a large tonnage is assured.

Tyler Wires run straight with no inclination of becoming slack at the edges.

Prices and samples will be mailed upon request.

The "Tyler Special" for Fourdrinier Machines

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CLEVELAND, OHIO

Corp., 200 cs. from Hamburg; Knauth, Nachod & Kuhne, 24 cs. from Hamburg; Order, 16 cs. from Hamburg.

Miscellaneous

Winsor & Newton, 3 bls. from London; Poland Paper Co., 8,437 bls. from Gothenburg; Palm Bros. Co., 16 cs. from Hamburg; Baldwin Shipping Co., 14 cs. from Hamburg; American Express Co., 5 cs. from Southampton; Pitt & Scott, 4 cs. from London; T. D. Downing & Co., 2 cs. from Havre; James McCreery & Co., 2 cs. from Havre; Irving National Bank, 3 cs. from Antwerp and 10 cs. from Hamburg; Defender Photo Supply Co., 5 cs. from Antwerp; L. A. Consmiller, 104 cs. from Rotterdam; New York Label & Box Works, 10 cs. from Rotterdam; Perry, Ryer & Co., 2 cs. from Havre; Wagner Bros. & Co., 2 cs. from Havre; M. J. Corbett & Co., 2 cs. from Havre and 5 cs. from Hamburg; J. Schulemann & Co., 2 pkgs. from Hamburg; A. M. Wechster & Co., 2 cs. from Havana; C. B. Richard & Co., 8 cs. from Hamburg; B. E. DeSola, 2 cs. from Hamburg; Fubs & Fubs Co., 3 cs. from Havre; R. L. Fuller & Co., 5 cs. from Havana; A. H. Ringk & Co., 35 cs. from Hamburg; P. J. Gienther, 4 bls. from Hamburg; E. M. Sostman, 7 cs. from Havre; Favor, Ruhl & Co., 4 cs. from Havre; O. G. Hempstead & Son, 15 cs. from Hamburg; R. F. Downing & Co., 4 cs. from London and 6 cs. from Havre; Mansell, Hunt & Catty, 6 cs. from London; Stern Shipping Corp., 2 cs. from Hamburg; Uniforeign Importing Co., 2 cs. from Havre; J. Victori, 2 cs. from Barcelona; F. B. Vandegrift & Co., 3 cs. from Barcelona and 2 cs. from Hamburg; Hard & Ritter, 2 cs. from Barcelona; G. Borgfeldt & Co., 25 cs. from Bremen; Japan Paper Co., 84 cs. from Genoa; P. H. Petry & Co., 3 cs. from Hamburg; W. A. Foster & Co., 2 cs. from Hamburg and 44 cs. from Rotterdam; Guaranty Trust Co., 94 cs. from Antwerp; P. Puttmann, 30 cs. from Antwerp; Order, 196 cs. from Marseilles, 3 cs. from Christiania and 11 cs. from London.

Foreign Trade Opportunities

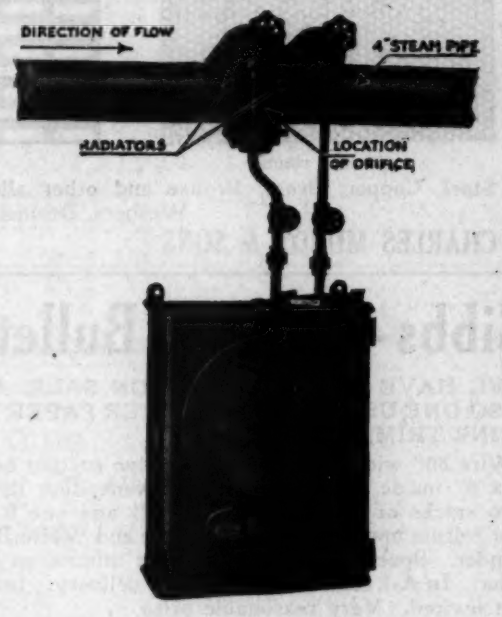
An editor in France desires to secure an agency for the sale of paper and stationery. Correspondence should be in French. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35080.

A manufacturing firm in Paraguay desires to purchase about 30,000 kilos of paper for making paper matches, already coated with wax, or similar substance, and ready for placing phosphorus on tip. A sample of the paper desired was forwarded and may be examined at the Bureau or its district offices. (Refer to file No. 29868.) Correspondence should be in Spanish. This firm wishes to have quotations c.i.f. Paraguayan port, terms, and 200 kilos of the paper as samples sent at once. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35081.

A mercantile firm in Mexico desires to purchase waterproof inner paper bags for packing sugar, size 23 by 40 inches; also chemical products, including caustic soda, soda ash and lump sulphur. Quotations should be given c.i.f. Mexican delivery, of Nogales, Arizona. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35067.

A commercial agent in Greece desires to secure the representation of firms for the sale of patent roofings and all sorts of asphalt goods for roofings. Samples are requested. No reference offered. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35062.

Bailey Fluid Meter



PRACTICAL — ACCURATE

This shows the Bailey Fluid Meter complete for the measurement of steam. It consists of the Monel metal orifice installed between a pair of flanges, radiators and valves tapped into the pipe on the inlet and outlet sides of the orifice and pipes connecting these to the recorder.

Bailey Fluid Meters are easily and cheaply installed as changes in piping are not required and the accuracy is guaranteed.

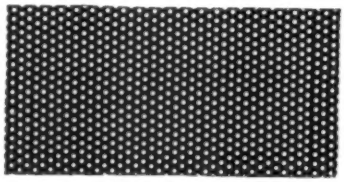
They are the most practical and satisfactory meters for recording and integrating the flow of steam to turbines, digesters, paper machines and other processes. Steam can be measured at any pressure and temperature, exhaust steam included.

Either pressure or temperature recorders, or both, may be added to record on the same chart as the rate of flow.

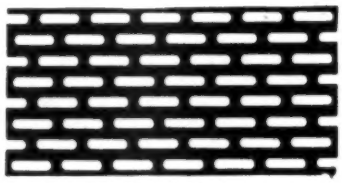
Our engineering department is ready to suggest the proper equipment for your service.

The BAILEY METER COMPANY
2023 East 46th Street, CLEVELAND, OHIO

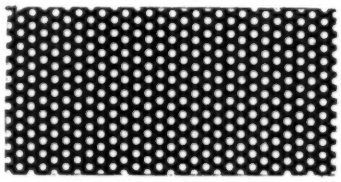
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



⅛ x ½" Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

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Wire 80" wide, 54' 6¾" long. Five suction boxes, 3" x 6" inside. Three presses. Twenty-four dryers. Two stacks of calenders—one 7 roll and one 9 roll. One 2-drum upright reel. One Moore and White Drum Winder. Speed of machine 400' per minute on book paper. In A-1 condition, immediate delivery. Inspection invited. Very reasonable price.

ALSO ONE BRAND NEW 112" BOARD MACHINE.

Seven 36" x 112" cylinders; Ninety 48" x 108" dryers; six 16" primary presses—rubber and gunmetal; four 20" main presses—rubber and gunmetal; two 5" roll calender stacks (largest roll 22" diameter, smallest roll 14" diameter); one stack with two upright reels; one single shaft winder; one complete Marshall driving train; seven 8 plate packer screens; Felt carrier rolls all brass covered. Dryer gears are cut. Immediate delivery. Duplicate can be seen in operation. Will sell for cash at very low figure.

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